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THE LATE MR. ALEXANDER CURTIS COPE, M.R.C.V.S.

It was with regret that we heard of the death of Mr. A. C. Cope, who until last year occupied the position of Chief Veterinary Officer to the Board of Agriculture.

Mr. Cope made his first acquaintance with the profession in 1855, being indentured to Mr. Stevens, of Park Lane, Piccadilly. Obtaining his diploma in 1858 he saw country practice in various districts in the North and West of England, but eventually settled down in the West End of London on his own account.

In 1866 he forsook private practice for the Government service, being offered an important post in the Veterinary Department of the Board of Agriculture. In that position, in conjunction with the late Professor Brown, he exercised a controlling influence over the interests of the farmers and stockowners of this country, and eventually, on the retirement of Professor Brown, assumed full control and was appointed the Chief Veterinary Officer, a position which he held until he was forced to retire in 1905 by reason of having attained the age limit.

His quiet and courteous manner made him a host of friends, tangible evidence of which was given by the presentation, on his retirement from office, of a silver tray and salvers and silver table ornaments subscribed for by the members of his staff and the local veterinary inspectors. Mr. Cope was an honorary member of the Royal Agricultural Society of England, an honour given to very few men. He was for many years a member of the Council of the Royal College of Veterinary Surgeons, and had filled the offices of President and Vice-President: he was also a Governor of the Royal Veterinary College.

It seems hard that after so many years of active service Mr. Cope should not have longer enjoyed his well-earned retirement.

Editorials.

THE EDUCATION OF THE MEAT INSPECTOR.

THE recent disclosures in connection with the Chicago meat trade have brought to the front a large number of opinions on the subject as to who are the fit and proper persons to whom meat inspection should be entrusted, and according to the report given in one of our daily papers, a certain member of the London County Council, who is also a member of the medical profession, is stated to have said that "a partial veterinary training should be an essential qualification for the suggested new class of food inspectors." This gentleman suggests further "that six or twelve months of veterinary training might be sufficient."

Does it not stand to reason that a plan which would give much greater security to the general public would be to appoint properly qualified veterinary surgeons whose duties would consist entirely in inspecting the flesh and produce of animals intended for human food? Surely no one is better fitted than the modern veterinarian to understand efficiently the subjects of meat and milk inspection, as the whole of his college training is entirely devoted to the diseases of the living and dead animals and the presentation of his diploma depending absolutely on the successful passing of an examination in these subjects.

A few towns in England have already one or more qualified veterinary surgeons as meat inspectors and their appointments have obtained the greatest praise from the public, whose health is thus satisfactorily guarded by men who understand their business; and, curiously enough, although at first there was some little trepidation on the part of certain rings of butchers, these tradesmen are now amongst the first to express their preference for the veterinary official as against the old system of allowing the inspection to remain in the hands of some one whose vocation previously was, in the majority of instances (as was elicited in an enquiry made some ten or twelve years ago), either that of a plumber, policeman, 'bus conductor, or bricklayer.

It is astonishing that England, the people of which boast that they possess the premier place in all matters of sanitary law, is still so far behind in a matter of such serious import to the health and wealth of the nation.

Perhaps it is charitable for the peace of mind of the general public that the members of the veterinary profession do not publicly disclose all they know concerning the amount of diseased meat and milk which is sold and consumed.

AN ANNUAL REGISTRATION FEE.

The recent suggestion of Major Butler that the Royal College of Veterinary Surgeons should be invited to consider the advisability of imposing an annual registration fee is well worth consideration in the present precarious state of the College coffers, and if it could be carried out, it would certainly tend to put the College funds on a substantial footing.

Other bodies have adopted the system, and the result has given them a very satisfactory standing.

The difficulty seems to be, as with the question of providing our members for Parliament, that it is impossible at present to formulate a scheme to which every member of the profession will willingly subscribe; for, until a new charter has been obtained, it is impossible to compel any such annual payment.

As estimated by Major Butler, even the small sum of half a guinea, levied yearly from each member of the profession, would produce £1,500 per annum, and would satisfactorily place the funds of the Royal College in such a position that they would be able to carry out necessary reforms and assist the profession to gain a prominent place in every sphere in which it ought legitimately to appear.

The tax is small, and the benefits derived would be great if the funds were judiciously applied, but it is not a matter which can be settled by voluntary effort, and compulsion is impossible under the present conditions which guide the profession.

"VETERINARY EDUCATION AND EXAMINATIONS."

BY M.

THE above subject is well worthy of serious consideration, and a discussion and an exchange of views cannot but prove of service in the investigation of the system at present in existence. If improvements which may be feasible can be pointed out, it is the express duty of those connected with veterinary education, and who are cognisant of those improvements, to put them forward, permit them to be discussed and, if approved of in the discussion, have representations made in the proper quarters in order to have them put into action.

"Syntax," in THE VETERINARY JOURNAL of two months ago, gave some idea of the aim of education, and noted a few changes which he considered advantageous and ought to be adopted. No one for a moment doubts that the present system has its defects, and that the ideal has not yet been attained, but it is necessary to find out if the changes recommended are practicable or expedient.

In the process of education examinations are employed as tests, and in veterinary education as a means of ascertaining the fitness or inability of the student to practise the art and science of veterinary surgery. Examinations are necessary evils and will exist until better means can be found of ascertaining the amount of knowledge which a person possesses. One of the changes advised by "Syntax" refers to the Board of Examiners, and the reasons given for the changes are:—(1) Economy on the part of the examining body (the Royal College of Veterinary Surgeons); and (2) greater fairness to teacher and student alike. The suggested alteration is that the Examining Board should be composed partly of teachers in the Veterinary School and partly of external examiners, that in each subject the examination should be carried on by two men, one an external examiner and the other a teacher in the school at which the professional examination is being held. At present the examining Board is entirely composed of external examiners, and the proposed change could only be brought about by a new Act of Parliament.

By means of this change it would no doubt be expected that the travelling expenses of one-half of the Examining Board would be saved, and it is even suggested that the internal examiners would give their services gratis in the work. I am rather inclined to think that the latter suggestion is not intended to be taken seriously, and that teachers in the various schools would prefer under such a condition that the existing system of external examiners only should remain as it is.

In respect of the question of fairness, it is stated that the teacher would have more scope in the true education of his students, and that there would be less so-called "spoon-meat" employed in the preparation. Under the present circumstances, the apparent advantages to be derived from this change would be more than counterbalanced by the defects which are likely to arise. At present the various schools in the British Isles are run on different lines, and depend to some extent for their existence upon the fees of the attending students. Were this alteration made in the system of examining, the tendency would be for the standard of examinations in some quarters to fall. As a consequence, the students would flock to those schools where they could

obtain an easier pass. Such a contingency could only be avoided when *all the schools* become Government institutions, or are controlled by some governing bodies who do not look so much to the number of passes as an index of the work and ability of the teacher, as to the excellence of the graduates sent out by the College.

Again, were the teacher made an examiner, I cannot at all see how the method of "cram" is to be avoided or abolished. When a teacher acts on an examining board, he does not take into account the work done by a student during the year. He examines and judges him on his own merit at the time of examination. Special powers would be required before any other attitude could be adopted by the teacher. That being the case, the student is allowed to "cram" his seven months' course into two or three months' work if he likes, and obtain at the examinations sometimes as much credit for the "ephemeral" knowledge which is his as the hard plodder who has worked conscientiously and regularly from the beginning of the session right up to the time of examination.

To avoid or abolish the method of "cram," it will be necessary to have a bye-law inserted among the Regulations of the Royal College to the effect that a student, besides conforming to the usual laws at present in vogue, must have obtained a fair average percentage at the monthly class examinations through the session before he is allowed to present himself at a professional examination. But here again such a bye-law could only be of service where all the schools are run on the same lines and by similar governing bodies.

Lastly it is suggested that a teacher is hampered in his work by the present system of examinations. He ought to be permitted greater latitude in dealing with his subject. In my opinion for most of the subjects taught at the schools the amount of work covered is quite great enough if it is satisfactorily done, and a tendency to widen the scope of the various portions of the curriculum would do more harm than good. There is not time in the seven months at the disposal of the student to cover more ground than he is doing. It would indeed be little better than a system of "cram" if such a thing were permitted. It is better to cover a small area but learn well the subjects with which we are dealing than to cover a large field and gain a very inaccurate superficial knowledge of the work.

At present my idea lies more in the way of cutting down the number of subjects in the curriculum than in widening their scope. I should like to see the subject of "Stable Management" made a portion of the preliminary examination, and in that way the number of subjects in the course lessened by one.

In my short experience as a teacher I have not been able to detect many shortcomings which can just now be remedied in the system of examining employed by the Royal College of Veterinary Surgeons. The best students whom one is always proud to present at a professional examination have in every case done well, and it is only with the inferior men, the men whose knowledge is not very great and who chiefly engage in the system of "cram" that difficulties arise. With these men chance or luck enters very largely into the results of any examinations at which they may present themselves, and the same thing would occur whether the examiners were internal or external. No advantage would arise from a change in the system of examina-

tions for these men, and perhaps under the circumstances it is as well that the examining body of the Royal College is an independent one. The examiners on the present board have usually been very considerate for the weak men of the year, and have given them every chance to display some knowledge on the subject on which they were being examined. Nervousness on the part of the student has also been taken into account and made allowance for. It has been said that a nervous student may not do himself justice before a strange examiner, but it seems to me that it is the importance of the results of the examinations rather than the examiner himself that upsets a student.

I have therefore to come to the same conclusion as "a teacher," that the present system of examinations carried on by the Royal College is the best under existing circumstances.

DISEASED MEAT AND THE WHOLESALE DEALER.

A DECISION of some importance from the point of view of the public health was recently given by the Divisional Court in a case in which a sanitary inspector for the borough of Paddington was the appellant and a slaughter-house keeper was the respondent. The sanitary inspector found in a bunch of pigs' plucks hanging up on the premises of a pork-butcher in the Harrow Road one which was tuberculous and which he accordingly seized. It was the practice of the pork-butcher, and had been so for two years, to submit daily his purchases to the sanitary inspector and not to sell anything until he had passed it. In these circumstances the particular plucks, among which the unsound one was found, were clearly not being offered for sale, as they had not been inspected, so that no proceedings were taken against the pork-butcher, but a summons was taken out against a person said to have been the original purveyor of the meat, a slaughter-house keeper from whom it was alleged that the pork-butcher had bought it. The matter would have been simple enough so far as the law was concerned had the diseased pluck been proved to have been exposed for sale as human food, but as it had not been offered as such the prosecution was met by a decision (Reg. *v.* Dennis, 1894, Q. B. 458) which seemed to lay down that in these circumstances no offence was committed by the original vendor, and the magistrate had accordingly dismissed the case on those grounds without going further into the facts. The Lord Chief Justice was, however, able to distinguish the case referred to as one in which it was not clear that the stuff in question had been sold as human food and in which a jury had been wrongly directed upon that point, and he delivered the judgment of the court to that effect, remitting the charge against the slaughter-house keeper to the magistrate in order that it might be tried out. The prosecution, it may be mentioned, was brought under Section 47 of the Public Health (London) Act, 1891, of which Sub-section 1 provides for the inspection and seizure of articles intended for the food of man and exposed for sale, throwing upon the person charged with exposing it the burden of proving that it was not intended for human consumption. Subsection 2 provides for the summary conviction of the person exposing the food, and Subsection 3 is as follows:—"Where it is shown that any article liable to be seized under this section and found in the possession of

any person, was purchased by him from another person for the food of man, and when so purchased was in such a condition as to be liable to be seized and condemned under this section, the person who so sold the same shall be liable to the fine and imprisonment above mentioned unless he proves that at the time he sold the said article he did not know, and had no reason to believe, that it was in such a condition.

Subsection 3 would certainly seem to have been intended to cover such facts as those alleged in the case described, and it would be a matter for regret if a person could not be convicted under Subsection 3 unless another person could also be convicted under Subsection 2.

(*The Lancet*).

AN EXAMINATION OF GOATS IN MALTA, WITH A VIEW TO ASCERTAIN TO WHAT EXTENT THEY ARE INFECTED WITH MEDITERRANEAN FEVER.*

BY DR. T. ZAMMIT (MEMBER OF THE MEDITERRANEAN FEVER COMMISSION).

(1) Attempts to Recover Micrococcus Melitensis From Goats Slaughtered at the Civil Abattoir.

As soon as goats were suspected to be liable to the infection of Mediterranean fever, an examination of the animals slaughtered at the civil abattoir was undertaken. None of the animals had been previously selected or examined, and some of them turned out to be male Barbary goats which had been brought to Malta to be fattened and sold as mutton. When a goat was killed a capillary tube was filled with blood for the serum test, and the spleen was carefully removed and taken to the laboratory for examination; forty-six goats were thus examined, and the microbe was recovered in one case only. The serum reaction showed, however, that more than one goat had at some time been suffering from Mediterranean fever, for seven of the bloods gave a clear positive reaction with *M. melitensis* at a dilution of at least 1 in 80. All the goats appeared to be in good condition, and were passed by the veterinary surgeon of the abattoir for consumption.

(2) Post-Mortem Examination of Goats Bought in June, 1904.

The goats bought by us in June, 1904, and found to be suffering from Mediterranean fever, were slaughtered in September, 1905. Of six animals, numbered one to six, No. 4 never gave a reaction for Mediterranean fever, and was therefore used for other experiments. No. 3 always reacted strongly after it was sent to the Lazaretto. In July, 1905, it lost flesh, and on August 2, being in a dying condition, it was killed and carefully examined. A large number of broth and agar tubes were inoculated with material taken from all the organs, but the *M. melitensis* was not recovered. Nos. 1, 2, 5 and 6 appeared quite healthy. They were slaughtered between September 25 and 29. The animals were in perfect condition, very fat, and with all the organs apparently healthy.

A great number of culture tubes were used for the examination, and fortunately so, for if fewer had been used it is probable that the microbe would have escaped notice in some of the cases. The *M.*

*Abstract from the Reports of the Commission on Mediterranean Fever.

melitensis was recovered from all the goats except from No. 2. During life this micro-organism had only been obtained from the blood of Nos. 5 and 6, but on the other hand it had been recovered from the urine and milk of all four goats. At the *post-mortem* examination the microbe appeared to be regularly distributed in the body and in rather small numbers.

In No. 1 it was obtained from the spleen and the kidneys, but in small quantities. In No. 5 it was recovered from the kidneys only. In No. 6 it was only found in the glands. Other goats (Nos. 15, 16, 17, 18), affected with Mediterranean fever, were slaughtered in September. The *M. melitensis* was recovered from all except from No. 18. In No. 15 it was obtained abundantly from the kidneys. In Nos. 16 and 17 only a few colonies were procured from the lymphatic glands. The serum reaction remained positive and constant in all the bloods, though in some of them it became very weak, not higher than 1 to 40.

The *M. melitensis* in infected goats tends to disappear from the system after a time, but the process is slow.

Our goats having been bought in June, 1904, already infected, we could not ascertain how long they might have been in that condition, but it is a fact that after fifteen months the specific micro-organism was still living in their lymphatic glands.

(3) Recovery of M. Melitensis from the Blood of Goats.

In certain phases of the disease the specific microbe circulates freely in the blood, and it can then be easily recovered. This condition does not seem, however, to last long, since a blood which yields the microbe one day, will not show any after the lapse of a week. About 5 cc. of blood were taken from the jugular vein of goats thirty-two times. The same animal was sometimes tried three or four times. The blood was distributed in 20 cc. broth tubes and incubated. The Micrococcus was only recovered from four goats (Nos. 5, 6, 21 and 29). The animals had all contracted the disease before they were obtained, and as when brought to us they already displayed a strong serum reaction, no idea could be formed as to the stage of the disease at which they had then arrived. Some of the cases were undoubtedly of long standing.

(4) The Reaction of Goats' Milk to the M. Melitensis.

On July 10, 1905, I observed that the agglutination test could be applied to the milk of goats affected by Mediterranean fever as well as to the blood. At a point in our investigations it had become difficult to obtain samples of blood from goats, as the owners strongly objected to have their animals bled. The use of milk instead of blood for the specific reaction proved a great help, and enabled us to examine a large number of goats.

The test can be applied on a slide in the ordinary way or in capillary pipettes, as in the method of precipitation. In time, however, the precipitation method was adopted as being more conclusive and easier to work, especially when a great number of samples had to be dealt with. The only precaution to be taken in applying the test is the addition of an antiseptic, strong enough to prevent the clotting of the milk, but without affecting in any way the agglutinins. For the examination of a large number of samples, the following method was found to answer best: A strong emulsion of the *M. melitensis* is prepared

in normal saline solution in a watch-glass. To this a small quantity of formaldehyde solution is added (one small loopful of a 1 per cent. solution), the whole being drawn into a pipette. One drop of the emulsion is placed on a glass slide, and a loopful of milk is mixed thoroughly into it. This mixture is then drawn up into a fine capillary pipette, left in an upright position for twelve hours, and the reaction noted at the end of that time. The reaction is often seen after a few minutes. The cream collects at the surface, and does not interfere with the reaction. Between July 10 and September 22, 1905, 710 samples of milk were examined, and a positive reaction was obtained 133 times. With a view to check the value of this method, all the milks that showed a positive reaction were tested a second time. Further, where possible, blood was obtained from the animal for the serum test, and the suspected milk was plated out.

The blood test constantly confirmed the milk test, and when a strong reaction was obtained the specific microbe was always recovered from the milk. In conclusion, in my opinion, the milk test is a safe one and quite as reliable as the blood test. For sanitary purposes, more especially where a great number of goats have to be examined, the milk test is at once convenient and efficient.

(5) The Milk Test as applied to Goats in the Country.

As soon as the susceptibility of the goat to Mediterranean fever had been established, it became obviously desirable to ascertain how far herds which supplied milk to the towns and villages were affected. In July, 1905, we heard from one of the district medical officers that cases of the fever were numerous in two villages, Lia and Balzan, whereas few or none were reported from the neighbouring village of Attard. These three villages form a group lying close together about the centre of the island. It was decided, therefore, to examine the herds of this group of villages first, and then work in other directions according to circumstances. Every village has a number of herds, but many goats are distributed singly, every family, as a rule, keeping a goat for its own use. I have arranged the result of the examination in the following tabular form :—

Name of village	Street	Number of goats in herd	Number of goats which reacted	Remarks
Lia ...	Molino Musta ..	15	None	
,, ...	Forni, 12	7	2	
,, ...	,, 24	4	None	
,, ...	Concezione	9	,,	
,, ...	Molino, 28	5	,,	
,, ...	Preziosi	13	,,	
,, ...	Concezione	11	,,	
,, ...	Reale, 9	1	,,	
,, ...	,, 128	2	,,	
,, ...	Stretta Enea, 2 ...	1	,,	
,, ...	,, ,, 3 ...	6	,,	
,, ..	Concezione, 33 ...	1	,,	
,, ...	,, Vlo, 3° ..	2	1	*M. melitensis* recovered. Case of Mediterranean fever on the premises.
,, ...	,, 28 ...	4	None	
,, ...	Forni, 54	1	,,	
,, ...	,, 42	1	,,	
.. ...	S. Andrea, 15	1	,,	

Name of village	Street	Number of goats in herd	Number of goats which reacted	Remarks.
Lia ...	No Address	4	2	Goats were being taken to Musta.
,, ...	Reale, 82	12	7	
Balzan ...	,, Vlo 2°	18	6	The Micrococcus recovered from 3. Two cases of Mediterranean fever on the premises during the last twelvemonth.
,, ...	Providenza Vlo, 2° ...	20	2	
,, ...	,, Vlo, 3° ...	7	None	
,, ...	,, Vlo, 2° ...	17	3	
,, ...	,, ...	16	2	
,, ...	3, Chiese, 25	18	2	
,, ...	,, 9	1	None	
,, ...	,, 33	1	1	
,, ...	Itmeida, 16	1	1	Case of Mediterranean fever on the premises.
,, ...	No Address	3	2	Goats were being taken to Musta.
Attard ...	Via C. Cormi, 22 ...	5	None	
,, ..	,, 2 ...	2	,,	
,, ...	Via Notabile, 3 ..	7	,,	
,, ...	Reale, 24	2	,,	
,, ...	Lunatic Asylum ...	31	,,	
,, ...	Molino Vlo, 1° ...	4	,,	
,, ...	,, ,, 14 ...	5	,,	
,, ..	S. Domenico, 19 ...	6	,,	
Zeitun ...	Herba, 16	8	,,	
,, ...	Giardino Botanico, 10	10	,,	
,, ...	Vlo Privato, 3	6	,,	
,, ...	Piazza Maggiore, 44 ...	12	,,	
,, ...	Madonna Pietà, 119 ...	11	1	
,, ...	Giardino B	11	1	
,, ...	Herba, 26	8	None	
,, ...	Sciortino, 22	11	,,	
,, ...	S. Giovanni	5	1	
,, ...	Sta. Maria	5	None	
,, ...	Marsascirocco, 11 ...	5	1	
,, ...	,, ,, (A.C.)	11	None	
Zabbar ...	Xghira, 75	8	1	
,, ..	Marsascala, 22... ...	8	None	
,, ...	,, 6... ...	18	5	Micrococcus recovered from 3.
,, ...	Piazza S. Giacomo, 30	11	1	
,, ...	Sta. Maria, 12	7	None	
,, ...	Marsascala	13	3	
,, ...	Vlo Hassajed	7	1	
,, ..	Xghira, 72	5	3	
,, ...	,, 71	11	3	
,, ...	S. Domenico, 1 ...	4	1	
,, ...	S. Giuseppe, 68 ...	18	2	
,, ...	Capuccini	14	1	
,, ...	Marsascala	6	2	
,, ..	,, ...	14	9	
,, ...	S. Domenico	10	7	
,, ...	Tal Fgura	24	5	Micrococcus recovered from 2.
Hamrun ...	Dolori 29	30	8	
,, ...	Vlo Tal Fatati... ...	18	11	
,, ...	,, ...	35	5	
Axiak ...	Via Gudia	10	2	
Curmi ...	S. Pietro	8	1	
Taxbiex ..	Via Sliema	5	None	

The principal herds of Lia, Balzan, Attard, Zeitun, and Zabbar were visited, and about one-half of the goats of those villages were tested. The percentage of infected animals is therefore practically accurate. It stands as 12 per cent. for Lia, 19 per cent. for Balzan, 0 per cent for Attard, 4 per cent. for Zeitun, and 25 per cent. for Zabbar.

As to Hamrun, only three herds were gone through, and there are hundreds of goats in that village. The percentage of infected goats at this place cannot be deduced from our work, but the three herds examined were badly infected.

(*Journal of the Royal Army Medical Corps.*)

ABSTRACT FROM THE ANNUAL REPORT OF THE SANITARY AND MARKET DEPARTMENTS OF THE CITY OF EDINBURGH FOR 1905.

Dairies.

The condition of the dairy shops has, as a general rule, been satisfactory during the past year, and the number of these has diminished by seven as compared with the number on the register on the corresponding date a year ago.

The general condition of the shops throughout has been found satisfactory, and the continued efforts which have been made have resulted in a generally improved tone and a greater desire on the part of the dairy-keepers themselves to diminish the stock of general goods in their premises, and to limit their trade as far as possible to articles specially associated with the dairying business. It is a matter of regret that difficulties exist in the way of introducing such regulations as will render it imperative for no article other than ordinary dairy produce to be kept and retailed in dairy premises. In the absence of a very strict regulation in regard to this matter, there will always remain a number of shops, the owners of which retail small quantities of milk in addition to carrying on their general business. It is such a class which, as a rule, requires the greatest amount of supervision, and in regard to which the greatest difficulties are experienced.

Visits of inspection, as heretofore, have been carried out by day and night, and, as a consequence of these, a considerable number of warnings have had to be given in regard to some slight breaches of the Dairy Regulations. In only four instances, however, did it become necessary to institute proceedings, and in all of these convictions followed. The contraventions chiefly entailed failure to keep premises in a cleanly condition, and, in one instance, had reference to the storing of milk vessels in a sleeping apartment.

Great care is always exercised in regard to the general condition of cleanliness in dairy premises, and it has been found requisite in seventy-five cases to order these to be painted or papered. The results at this time are satisfactory.

It is considered advisable to direct attention to the prevailing

custom, which is followed by almost all of the dairy-keepers in the city, of delivering milk to the houses of their customers in tin vessels. These vessels are retained in the houses during a longer or shorter period. The risk involved in connection with such a method is quite apparent, and there appears no reason against a regulation being introduced which would prohibit such a method entirely, and render it compulsory for all milk on delivery being decanted into the vessels belonging to customers. Such a regulation could not fail to be welcomed by dairy-keepers themselves, and would certainly prove a useful precaution against the possible conveyance of infectious disease from house to house.

From time to time reports have been furnished in regard to the milk supply in connection with the Cattle Market. These reports have set forth all details in regard to existing conditions there. It has been pointed out that the milking of cows in the Market and the sale of such milk is entrusted to byremen whose duty it is to attend to the animals in their masters' interests while housed in the Market premises prior to sale. The whole conditions are unsatisfactory, and several cases of milk adulteration have been detected during the past year. It may again be suggested that the milking of cows consigned to the Cattle Market and the disposal of such milk are duties which should properly fall to be discharged by the Market Authorities, and, looking to the large amount of milk which passes into general circulation from this source, the propriety of introducing the needful regulations in regard to this matter is again strongly urged.

Cow Byres.

Year by year there have been demolished some of the oldest and most insanitary byres in the city, with the result that the number of objectionable premises is now greatly reduced. In conformity with this custom seven of the worst byres have, during the past year, been condemned and closed. These have included a large one at Blackford Avenue, in regard to which the difficulties in connection with drainage were such as to render its continued occupation impossible. Another very old-fashioned and unsatisfactory byre in Leven Street was demolished in connection with the clearing of a site there, preliminary to the erection of a new theatre. A large byre, capable of accommodating sixty cows, and situated at North Merchiston, required also to be closed; the insanitary and unsatisfactory conditions generally of this place necessitated objections being lodged against renewal of the licence, and, this having been done, the premises were vacated. Other old and insanitary premises, which were dealt with in a similar manner, included byres at Balbirnie Place, Dorset Place, St. Leonard's Street, and Braid Burn.

Four licences for new premises were granted during the year. Three of these represented small premises, most of which contained cows for the supply of milk to the owner or employees; the fourth byre, however, was a large one recently erected at Restalrig. This latter is in all respects what may be termed a model byre; it is licensed for forty-eight cows, and contains in a very excellent manner all of the most recent requirements in regard to sanitation and healthy conditions for the cows that are there housed.

One of the regulations in regard to byre construction requires

that the inner walls of all such premises be cemented to a height of six feet from the ground. The importance of this provision is very great, owing to the fact that it has been frequently found that the expectoration from cows suffering from a tuberculous condition of the lungs adheres to the wall of the stalls in which they are confined, and cannot be satisfactorily cleansed in the absence of a smooth cement surface. During the year it was found that twenty cow byres—chiefly in the extended area of the city—were without this important provision, and it became necessary at the licensing term in May last, to state objections against the renewal of licences until this work had been completed. It is satisfactory to report that in all other cases this has been done, and that the conditions in this respect, in these and in all other byres, now removes the possibility of danger so far as this matter is concerned, and permits of the constant cleansing being carried out which is required under the dairy regulations.

It was considered advisable during the year to re-measure every byre in order to ensure that no overcrowding existed, and that the minimum space required was available in all of them. The amount of such space is 500 cubic feet in the case of old premises, and 800 cubic feet in new or reconstructed ones. As a result of such re-measurement it became necessary in a few cases to diminish the number of cows for which licences had previously been granted.

It is considered advisable to direct attention at this time to the great necessity which exists for the introduction of a new regulation in regard to cow byres, requiring the provision in all cases of a special "milking shed" where all milking operations should be conducted. It must be pointed out that all animals which are housed in city byres remain confined in their stalls during their whole milk-giving period, which represents nine or ten months, and are not removed for any purpose whatever until the expiry of that time. It is evident, therefore, that however strict may be the inspection, or however much attention may be paid to general cleanliness, the conditions which must always remain present—even under the most satisfactory circumstances—are not in any sense favourable to the safeguarding of the purity of the milk. Milking operations are carried out three times a day, and these are conducted in the stalls where the cows stand. It is almost impossible to imagine that amidst such surroundings milk can remain perfectly pure. There could really be no hardship entailed in making the requirement which is now suggested, and the advantages resulting would be very great. In the first place, the health of the cows would be improved by their being taken to the fresh air at least three times each day, and, in the next, it is certain that their being milked where no source of contamination was present could not fail to have a satisfactory effect on the cleanly and healthy condition of the milk supply.

No. of byres in the city	111
No. of byres from which licences have been withdrawn ...	7
No. of new licences granted	4
No. of private byres	9
No. of inspections	2,113
No. of cows in licensed byre premises	2,942
No. of cows in private byres	13

Alterations and Improvements Carried Out.

Improved ventilation introduced	15
Manure pits reconstructed and drained, &c.	4
Window area increased, and lighting of byre improved ...	8
Courtyards repaved and properly drained &c.	4
Byre premises rebuilt or reconstructed	1
Floors levelled and cemented	10
Internal part of byre walls cemented	20
Ventilation into stables built up	5
Improved drainage of byre	3
Total	70

Contraventions of Bye-Laws Dealt With.

Storing milk vessels in byre	4
Want of bedding and not keeping cows clean	2
Byres not having cement on inside walls	20
Sleeping rooms communicating with byres	2
Keeping cows in unlicensed premises	2

One cow-keeper was fined £1.
One cow-keeper was fined £3, and 23s. expenses.

Notices Served.

Accumulating manure	26
Lime-washing of premises	224

Meat Inspection.

The supply of meat to the city consists of both Home and Foreign meat. The former, with very few exceptions, is all prepared in the city slaughter-houses, where it is under the constant supervision of the veterinary inspectors, one of whom is always on duty there. Immediately after being passed as fit for food, a number of the carcases are removed to the city butchers' shops, while a number of others are transferred to the dead meat sales, where they are exposed to public auction. These sale-rooms also receive a few contributions addressed to them from country districts, and, immediately on arrival, all carcases are hung up and remain open to inspection for several hours prior to being offered for sale. During this time the sale-room is frequently visited by a veterinary inspector, and every carcase is subjected to a critical examination.

During the year the number of animals dealt with in the city slaughter-houses shows a diminution of about 6,000 as compared with the previous year. While the number of cattle dealt with exceeded the previous year's total by about 1,300, there was a considerable decrease in the number of pigs, and chiefly in the number of sheep which were sent to the slaughter-houses; indeed, in regard to the latter class, it is found that 6,000 fewer than in the previous year were dealt with there.

The total number of carcases condemned during the year in the slaughter-houses is also in excess of the previous year, but this is chiefly accounted for by the number of pigs which were slaughtered under instructions from the Board of Agriculture, and required to be condemned on account of their emaciated condition.

The amount of foreign meat which has been imported shows a considerable increase as compared with the past few years. This is chiefly due to the large quantity of frozen, boneless, meat which arrives in the city in quantities reaching from six to seven tons each week. As the trade in this material is of quite recent date—having been commenced within the past year or two—the total quantity imported represents, generally, the amount of foreign meat dealt with in excess of previous years. In addition to this class of meat, there are also three other distinct classes of foreign meat which are imported to the city. These include—(*a*) Imported fresh carcases; (*b*) Imported frozen meat; and (*c*) Imported chilled meat.

The imported fresh carcases are wholly American, and represent animals which are sent chiefly from the United States, and are slaughtered at home ports immediately on their arrival. The carcases are packed in canvas, and arrive here by rail. Immediately on their arrival they are transferred to the dead meat sale-rooms, where the canvas covers are removed, the carcases hung up, and an inspection of each is made.

The imported frozen meat consists of—

(1) Carcases of ox and bull beef which are cut in quarters and sent in a frozen condition, chiefly from the Argentine Republic and America. Each of these quarters is wrapped in a gauze cover, and each bears a stamp indicating that it has been inspected and passed by the examining officer at the place of slaughter.

(2) Frozen sheep and lamb carcases—of which about 36,000 arrived in this city during the past year from Australia, the Argentine Republic, and New Zealand. Each of these carcases also is wrapped in a gauze cover, and nearly all arrive by steamer to Leith. None of them bear any stamp of inspection, although it is a known fact that at the ports of shipment there are veterinary inspectors whose duty it is to examine and pass each carcase before being exported. There appears no reason, however, why the same method of stamping which is adopted in connection with carcases of beef should not also be required in connection with those of sheep and lambs.

(3) Frozen pig carcases and portions of pig carcases. These are shipped from the United States, and the annual quantity received represents about 6,000 carcases. There is little difficulty met with in inspecting these when whole, but, when cut into portions and packed in boxes, as is frequently the case, inspections cannot in every sense be satisfactorily carried out, and a considerable amount of reliance must be placed upon a numbered and signed certificate which accompanies each box.

The imported chilled meat. This consists of carcases of beef imported from America. Each of these is divided into quarters, and each quarter is enclosed in a gauze cover bearing a stamp, indicating that inspection has taken place before shipment.

In regard to all of the foregoing classes of imported foreign meat, inspection is carried out at the railway stations on arrival, at the

dead meat sales, at the public refrigerator, or in the butchers' shops.

A special report has recently been presented to your Public Health Committee in reference to the importation of frozen boneless meat, and instructions have been received to carry out special investigations in connection with this, and to periodically submit samples of it for bacteriological examination. These instructions are now in course of being carried into effect.

While no seizures of imported meat have been made during the year on account of diseased conditions, it has been necessary to make several in cases in which meat was found in a decomposing condition. A strict supervision is necessary in connection with the possibility of this occurring, as it is well known that meat which has been frozen or chilled rapidly decomposes after the thawing process has set in.

The number of seizures of food material made at the railway stations, shops, and elsewhere, when exposed for sale or in transmission has been greater during the past year than for some years previously, and the total amount of fines imposed has amounted to over £52.

When shops are visited for the purpose of inspecting food material special attention is always paid to their sanitary condition, and a considerable number of defects have been found present, which have required to be at once remedied. Details of these are set forth in a separate table.

TABLE SHEWING THE DISEASES FOUND IN THE CARCASES SEIZED IN THE SLAUGHTER-HOUSES AND THROUGHOUT THE CITY.

DISEASE	Cows	Bulls	Bull'cks	Heifers	Calves	Pigs	Sheep	Totals
Tuberculosis	44	8	49	12	1	3	—	117
Decomposition	7	—	1	—	4	5	42	59
Emaciation	7	—	1	—	2	75	47	132
Enteritis	3	—	2	—	32	5	17	59
Œdema	3	—	—	—	1	3	13	20
Pyrexia	13	—	1	—	—	2	1	17
Traumatism	1	—	—	—	—	—	8	9
Pneumonia	4	—	1	—	1	—	3	9
Septicæmia	2	—	1	—	1	—	—	4
Carditis	1	—	—	—	—	—	—	1
Urticaria	—	—	—	—	—	—	1	1
Asphyxia	—	—	2	—	—	—	12	14
Cystitis	—	—	—	—	—	—	1	1
Pleurisy	—	—	—	—	1	—	1	2
Pericarditis	1	—	—	—	—	—	—	1
Hæmorrhage	—	—	1	—	—	—	—	1
Nephritis	1	—	—	—	—	—	—	1
Antinomycosis	—	—	1	—	—	—	—	1
Peritonitis	2	—	—	—	—	—	—	2
Icterus...	—	—	—	—	—	1	—	1
Metritis	1	—	—	—	—	—	—	1
Totals	90	8	60	12	43	94	146	453

TABLE SHOWING THE EXTENT OF INFECTION IN CONDEMNED TUBERCULOUS CARCASES.

	No. of Animals	Lungs			Heart and Pericardium			Pleuræ			Liver			Spleen			Bowels			Peritoneum			Udder			Other Organs				Lymphatic Glands			Emaciated
		Slightly	Considerably	Severely	Slightly	Considerably	Severely	Slightly	Considerably	Severely	Slightly	Considerably	Severely	Slightly	Considerably	Severely	Slightly	Considerably	Severely	Slightly	Considerably	Severely	Slightly	Considerably	Severely	Larynx	Kidneys	Uterus	Brain	Slightly	Considerably	Severely	
Animals with 1 organ affected	2	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Animals with 2 organs affected	19	5	12	2	1	—	—	7	8	—	2	—	—	—	—	—	—	2	—	1	—	—	—	—	—	—	—	—	—	4	—	5
Animals with 3 organs affected	12	1	7	4	1	—	1	2	7	1	4	—	1	—	—	—	3	3	—	1	—	—	—	2	—	—	—	—	—	7	—	—
Animals with 4 organs affected	18	3	11	2	1	—	—	5	8	1	4	3	2	1	2	—	2	8	1	8	5	3	—	—	—	2	—	—	—	5	9	1	—
Animals with 5 organs affected	35	11	18	6	—	1	—	13	14	7	14	14	5	3	9	—	9	16	8	5	22	9	1	—	—	—	—	—	—	6	20	8	—
Animals with 6 organs affected	17	8	8	1	1	—	1	8	7	2	6	8	2	2	8	3	4	9	2	4	5	4	—	2	—	2	1	2	—	3	10	4	—
Animals with 7 or more organs affected	5	—	3	2	—	1	—	—	2	3	3	2	—	—	5	—	2	3	—	1	4	—	—	4	—	1	—	1	1	—	5	—	—
	108	28	61	17	4	2	2	35	46	14	33	27	10	6	24	3	20	41	11	20	36	16	1	8	—	5	1	3	1	14	55	13	5
	108	106			8			95			70			33			72			72			9			10				82			5

TUBERCULOSIS IN COWS.

	No. of Cows.
Total number of cows slaughtered during the year...	265
Do. condemned for tuberculosis	43
Being a proportion of the total number of cows slaughtered of	16·226 per cent.
Or a proportion of the total bovine species slaughtered of	0·357 ,,
There had been consigned from the City	16
Do. do. beyond the City ...	27
Number of cases where udders were tuberculous ...	9
Or a proportion of the total cows affected...	20·93 per cent.
Cows with tuberculous udders supplying Edinburgh with milk:—	
From the City byres 4	
From beyond the City 4	
	8
Three of those from the City byres were ordered out by the inspector.	
Cows with tuberculous udders not supplying Edinburgh with milk	1

The following gives approximately the quantities of beef, mutton, and veal brought into the City from abroad, for the year 1905:—

	No. of Carcases.
Beef, American, port killed	2,600
Do. Chilled and Frozen	3,400
Mutton and Lamb, River Plate and New Zealand	36,000
Pork, American chilled	6,000
Veal, Dutch	2,200
Total ...	50,200

NOTE ON AN EQUINE PIROPLASMA, OBSERVED IN ALGERIA.

BY M. J. ROGER, MILITARY VETERINARY SURGEON, FIRST CLASS.*

I HAVE observed in some of the French horses in the artillery regiments of the Oran division, a piroplasma which I think should be named "Petechial equine piroplasma."

The disease is seen in several forms:

The benign form.—The horses are brought for examination because they show themselves extremely soft at work and poor feeders. No great function of the body appears to be upset. There is a slight elevation of temperature (102° to 103°) the mucous membranes are pale and have petechiæ on the conjunctiva and membrana nictitans.

The mucous discharge from the eyes has a cream-coloured appearance, stained with bright red or violet streaks, the extremities are

* Translated from the *Receuil de Méd. Vétérinaire*, by Major Marriott, A. V. Corps.

slightly swollen, the fæces normal in form and volume but of a brownish tint, and the subjects lose flesh rapidly.

Convalescence commences about the 4th to the 8th day, and is always very slow, the first sign being the disappearance of the petechiæ and the return of the appetite. The prognosis is good.

The hemoglobinuric form.—Patient suddenly attacked, staggering gait, temperature high (106° to 107°), paleness of the mucous membranes, and petechiæ on the conjunctiva and membrana nictitans.

These symptoms rapidly subside and the convalescence is short.

Acute form.—Sudden seizure of a typhoid nature, eyes half closed, head carried low, hanging back in the stall at the end of the chain, body covered with flies in the summer, temperature varying from 103° to 107°, movement difficult (often causing the patient to fall) with hind legs stiff and dragging of the toes, anorexia, rapid emaciation, pulse small and thready. The dilated nostrils and heaving flanks suggest chest disease, but percussion gives negative results, and auscultation limits itself to the region about the trachea and heart. Some enormous petechiæ occupy the membrana nictitans and the conjunctiva, the latter being pale or cream-coloured, but these symptoms are never well marked for the first few days.

Hemorrhagic spots, some the size of a sixpence, which occupy the whole of the membrana nictitans, are a bright red colour at the borders, and, owing to changes in the hæmoglobin, there is a play of colours to a duller red towards the centre. Sometimes blood-stained tears are seen.

The pituitary membrane is studded over with punctiform petechiæ.

From the commencement of the attack the extremities and sheath are slightly swollen, and in a few days the œdema of the sheath makes micturition difficult. This extends along the abdominal wall to the chest, so much so that the fore legs seem to be both coming out from the same place. The patient supports himself first with one hind leg and then the other, and seldom lies down.

One sometimes sees colicky pains perhaps connected with the petechiæ in the intestines. The fœces are blood-stained, and often contain blood clots, each the size of a nut; indeed, in some cases the thermometer is stained by the blood.

When the patient's strength is exhausted he falls down and remains on his side.

The mucous membranes assume a bilious tint, and the animal exudes a disagreeable odour. The death struggle may last twenty-four hours, and during this time the swellings become absorbed and have quite disappeared at the time of death. Sometimes there are spots on the sclerotic.

In one patient, which entered the infirmary on June 20, and died on July 2, a careful *post mortem* revealed the following lesions:—

Body very emaciated, with a pale, yellow hypertrophy of the lymphatic glands; the spleen of normal size, studded over with hæmorrhagic patches on both surfaces, and a red-brown line about an inch wide along the upper border.

The liver hypertrophied and of a light yellow colour. On Glisson's capsule there was a sclerotic patch the size of the hand.

The kidneys, normal in size, pale, and containing some pus in the pelvis.

The stomach contained some alimentary matter of a bright yellow colour, due to intense biliary impregnation. On the intestinal mucous membrane some light red spots existed.

Heart hypertrophied, the large vessels enclosing some fibrinous clots.

Lungs emphysematous.

Pleura and peritoneum yellowish.

Brain vessels dilated and the arachnoid fluid blood-stained.

Diagnosis.—In a stud we can recognise the disease at once by simple examination of the conjunctiva. All subjects showing petechiæ are strongly suspected of having piro-plasmosis.

The hæmoglobinuric form is easily distinguished from *hæmoglobinuria a frigore* by the paleness of the mucous membranes.

When there is anasarca, there is co-relation between the œdema of the extremities and that of the body, the œdema terminates abruptly, and finally there is a manifest tendency to gangrene.

The piroplasma which I have seen differs from that which others have observed.

First, it has not from the beginning the icteric discolouration of the mucous membranes.

Secondly, because all the patients have had some petechiæ on the conjunctiva and the membrana nictatans, and this is only observed in the grave forms of the equine piroplasma.

These differences are so distinct, from a clinical point of view, that the first may be called icteric equine piroplasma, and the second, petechial equine piroplasma.

Bacterial Diagnosis and Technique.—A drop of blood is fixed by immersion for ten seconds in absolute alcohol, and after evaporation of the film is treated for thirty seconds with Lignière's ½ per cent. solution of methylene blue.

Examined under a high power, the parasites are seen in the red corpuscles, resembling the *piroplasma bigeminum*. The corpuscles are coloured green and the parasites pale blue; this double stain facilitates examination.

The contour of the parasite is deeply coloured, but the central part is paler.

One often meets some piriform bodies enclosing a nucleus at their base and some fine granules disseminated in the protoplasm. Sometimes these bodies are two in number and resemble the disposition of the *piroplasma begeminum*, being both spherical and bacilliform (but these may be only piriform bodies seen in profile). The parasites are usually contained in the red corpuscle, but sometimes spherical bodies are seen outside them.

The blood parasites are numerous in the grave form, but very rare in the benign.

Origin of the Disease.—The probable origin of the disease is transmission by ticks, with which the horses were attacked during the time they were at the camp at Lourmel.

I estimate that piroplasmosis is widely diffused throughout Algeria. Personally I have seen several cases of relapses in horses, notably in the extreme South of Oran, in the recent campaign against the Arabs.

The absence of proper means of investigation have prevented me from making a certain diagnosis.

Clinical Articles.

THREE CASES OF OSTEOTOMY IN CASES OF SPLINT LAMENESS.

BY LIEUTENANT H. J. HOLNESS, ARMY VETERINARY DEPARTMENT, POTCHEFSTROOM, SOUTH AFRICA.

CASE 1.—Was a chestnut Arab entire which had been previously treated for splint lameness by firing and blistering, but in which lameness recurred. As the exostosis was badly placed, namely, well behind the small metacarpal bone and close up against the tendons, it was decided to extirpate it.

The case was operated on by Col. J. A. Nunn, A.V.D., on March 15, 1906. The animal was cast and an anæsthetic given; the strictest possible antiseptic precautions were taken, and by the use of an Esmach bandage and tourniquet the operation was performed bloodlessly.

The instruments employed were those commonly used in neurectomy, with the addition of a carpenter's $\frac{3}{8}$ inch half-curved gouge and a small hammer. The operation consisted in cutting down directly upon the splint and making an incision about two inches long. The subcutaneous fascia was dissected away, and the periosteum covering the bony enlargement scraped away to one side. By means of the hammer and gouge the exostosis was chiselled away, a small quantity of bone being removed around the base, and the sharp edges of bone and any chips were removed, the displaced periosteum restored, as far as possible, to its normal position, and the edges of the wound brought into apposition by three interrupted sutures, the limb was then dressed and bandaged, the animal was placed in a box and kept on fairly low diet.

On March 19 the dressings were removed and the case examined, when it was found that two of the stitches had come out and that granulation had taken place, resulting in the formation of proud flesh. The animal was again cast, the granulations removed, and fresh stitches put in to replace the broken ones. The affected part was dressed with hydrarg. perchlor. 1-1500.

On March 22 the case was again examined, when it was found to be doing well, the new stitches had held and satisfactory healing was taking place; dry dressing was substituted for the hydrarg. perchlor. During the next four days the wound was dressed twice, and on the 26th the stitches were removed and cold water irrigation was employed one hour in the morning and evening; the part was dry-dressed after irrigation, but no bandages were used.

On April 1 walking exercise twice daily for half-an-hour and cold-water bandages applied during the day, being substituted by dry-pressure bandage at night.

On April 19 the animal was discharged from hospital, and showed no signs of lameness.

The case showed very little signs of the operation, a small amount of thickening of the skin and subcutaneous tissue being all there was to be seen; there was no sign of any bony enlargement, and to the best of my knowledge the pony has gone on well ever since.

CASE 2.—Was a horse belonging to the 4th (Queen's Own) Hussars, admitted to hospital suffering from lameness, due to three little splints situated close to the edge of the tendons; the animal was very lame, and showed the usual signs of splint lameness.

This case I operated on on March 28, the usual antiseptic precautions being taken, and by the use of Esmach's bandage and tourniquet a practically bloodless operation was performed. The details of the operation are identical with those in Case 1.

The dressing employed after the operation was hydrarg. perchlor. 1-1500, but in this case the bandages were only left on three days, when, on examination, the wound was found to have practically healed; the stitches were removed and the wound dry-dressed, sufficient bandage being used to keep the dressing in place. At the end of a week the animal was sent to walking exercise. The treatment adopted was cold water irrigation twice daily and no further dressing was required. On April 25 the animal was discharged to duty, and has since performed his work well.

CASE 3.—Was a heavy field artillery horse suffering from splint lameness, due to a well-defined splint situated high up on the metacarpus; its position suggested complete extirpation. I operated upon the case on April 18; the details of the operation and after treatment being as in Cases 1 and 2; the result of the treatment was in this case highly satisfactory. The wound healed by first intention, and on April 29, eleven days after operation, the animal was walking well, and showed no lameness when trotted.

Observation of the Cases.—(1) The operation is one that is justified by results, that is, providing one chooses one's cases and care is taken at the time of operating and in the subsequent treatment.

(2) Extravagant care, cleanliness and asepsis of part operated upon and of the operator and his assistants is justified by results, so far as healing is concerned, and this care must be continued until the wound has completely healed.

EXCISION OF THE EYEBALL AND SUBSTITUTION OF A GLASS EYE IN A DOG.

BY ERNEST CHILD, M.R.C.V.S., LEEDS.

THE subject of the above operation was a fox terrier dog, 7 years old, whose right eye was severely scratched by a cat in February last.

Professional advice was not sought by the owner until the more acute and painful symptoms had subsided.

The eye had become very repulsive in appearance, and swollen, and protruded from the orbit in a manner which made it appear nearly twice the size of the normal one. The cornea had lost its transparency, and the sight was permanently destroyed.

The owner desired that the eye should be removed and an artificial one substituted if possible.

The operation was performed on April 5, and the instruments used were a tenaculum, a pair of ordinary dressing forceps, and a pair of blunt-pointed curved scissors, all of which were sterilised by boiling for fifteen minutes in a saucepan.

The animal was anæsthetised with the apparatus recommended by Professor Hobday, and, when fully unconscious, the mask was slipped off, and the dog's nose held in the mouth of a glass jam jar containing a piece of wadding soaked in two drachms of chloroform.

The eye-ball was gently lifted out of the orbit with the tenaculum, the conjunctiva grasped with the forceps and snipped round close to the eyeball, the straight and oblique muscles being divided as close to the sclerotic coat as possible. Finally the optic nerve and blood vessels were severed, the latter being accompanied by some hæmorrhage, which was soon stopped by lightly plugging with aseptic wool.

The orbital gland and membrana nictitans were left *in situ*.

The glass eye *in situ*.

After treatment consisted in gently fomenting and washing out the orbit with warm water and weak antiseptic solution.

The soreness, which was rather severe for a few days, quickly subsided, but the eye-lids seemed to become paralysed and drooped into the orbital cavity, the upper one falling inside the lower one, so that the hair on the outside of the former fell out, and the lids seemed likely to become sore.

On April 15 a human artificial eye was put in but the animal immediately rubbed it out, with evidence of pain, and it was therefore not replaced for three or four days.

When it was again inserted the dog removed it at once on each of the first two days, but did not interfere with it afterwards, and now he moves his eyelids as well as he did before the operation.

On the recommendation of Professor Hobday, a solid artificial eye has lately been used instead of the hollow eye of the human pattern, and has proved much more satisfactory, as it is more easily removed, cleansed, and replaced. It also looks more natural.

In conclusion, it only remains to be said that the dog wears the artificial-eye continuously day and night, does not offer to touch it, and that the case is an unqualified success.

OVARIOTOMY OF A TROUBLESOME MARE.

BY C. W. HOWARD, M.R.C.V.S., DORKING.

EARLY in 1902 my advice was sought in regard to a thoroughbred steeplechase mare; a very good animal, but bad tempered when in œstrum. At these periods she would squeal and kick when approached, and it was impossible to groom her thoroughly. As the mare was aged and this condition had existed off and on for some considerable time, I advised the owner to let me perform ovariotomy. To this he consented, and, after due preparation, on May 15 the animal was cast and chloroformed. The vaginal passage was carefully disinfected with chinosol solution, and all the instruments were sterilised by boiling. Upon attempting to penetrate the vaginal wall the greatest difficulty was experienced, after the initial puncture had been made with the knife, in enlarging the opening to a sufficient size to admit my hand, the tissues being extraordinarily tough.

The ovaries were found and removed in the manner described by Professor Hobday in his book on this subject.

On being allowed to rise, the mare's respirations appeared very hurried, and in the evening she was dull and refused all food, the temperature being 103°.

On the following day, with the exception of a small quantity of grass, she refused everything, but on the 17th the temperature was only 101°, and she seemed decidedly better. On the 18th she was turned out to grass and left there for a month. When brought into the stable again all her troublesome habits had ceased and she could be groomed quite readily. When approached and mounted, beyond putting back the ears and slightly raising her tail, she was perfectly quiet, and her improvement has been definitely maintained.

At the present time she is working satisfactorily.

LYMPHO-SARCOMA OF THE INTESTINE OF A DOG.

BY FREDERICK HOBDAY, F.R.C.V.S., F.R.S.E., KENSINGTON.

THE patient, a poodle bitch, 7 years old, appeared in excellent condition, with the exception of a tendency to obesity, until about the middle of April, when she appeared dull and had recurring attacks of vomiting and diarrhœa. She had had two litters of puppies about the middle of April. The attacks became persistent and the expression of her face was very pathetic; temperature was normal, and there was pain in the abdominal region when external pressure was applied.

Various dietaries were tried, and, by way of medicine, preparations containing ingluvine, bismuth, iodine, carbolic acid, hydrocyanic acid, pepsin, and alcholic stimulants, respectively, were tried with various, but always exceedingly temporary, success. The vomiting and diarrhœa would cease for a few hours and sometimes even for a whole day, but never longer. For three weeks she was kept alive on fluid food, such as Brand's essence, virol, somatose, beef-tea, peptonised milk, eggs, &c., either given by the mouth or in the form of nutrient enemas.

At the end of that time she made improvement, but was per-

ceptibly becoming weaker and losing interest in her surroundings. She was painlessly put away with chloroform.

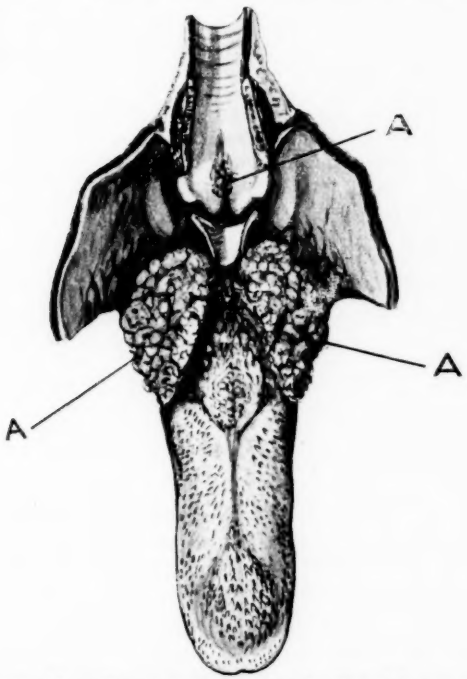
Post-mortem examination revealed the presence of three ulcers in the stomach, one being of tolerably recent origin, and the other two almost healed. There was a tumour the size of a hazel-nut in the wall of the small intestine, about half an inch from the pyloric orifice of the stomach, and there were four others, each about the size of a filbert-nut, in a cluster about the middle of the duodenum, with three others about three inches below it. At the junction of the caecum and colon there was a large bunch, the growths varying in size from a Barcelona nut to a large walnut.

The specimens were forwarded to Dr. Bashford, of the Cancer Research Association; this gentleman kindly examined them and declared them to be lympho-sarcomata.

AN INTERESTING GROWTH IN THE FAUCES OF A KITTEN.

BY HENRY EVE, M.R.C.V.S., BATH.

THE patient, a neuter cat, aged 3 years, was noticed by its owner to be affected with some apparent obstruction in the throat, having



Tongue of kitten with papillomatous growth (A) at the sides of the tongue and on the larynx.

difficulty in swallowing and occasionally salivating from the mouth. When I saw the patient some two months ago, I noticed the following symptoms:—Emaciation, loss of appetite, salivation, and general malaise and prostration.

Thinking that I had an ulcerated condition of the throat to deal with, I prescribed a gargle composed of chlorate of potash and water; and, as I did not hear further from the owner, I concluded that the animal had probably recovered.

On May 15 I was again called in, and upon examination of the back of the throat observed a granulous excrescence, about half the size of the kernel of a hazelnut, on either side of the back of the tongue, almost occluding the orifice of the larynx. The animal almost choked when I was examining the throat; and thinking the case hopeless, I advised the owner to have the patient destroyed.

The specimen was sent to Sir John McFadyean, who proclaimed the growths to be papillomas.

AN INTERESTING CASE OF ASPHYXIA IN A FOAL.

BY F. H. RIDLER, M.R.C.V.S., KENSINGTON, W.

On June 9, whilst away in the country, I was asked to look at a foal which had been taken suddenly ill. The animal was only eleven days old, and appeared to be suffering from acute laryngitis. I prescribed the usual remedies, and had the nostrils well steamed with hot inhalations. This gave temporary relief for a few hours; but well-marked symptoms of asphyxia again appeared, so much so that I was compelled to open the trachea. On passing my fingers through the opening into the windpipe, I distinctly felt a number of fibrous bands stretching across it; these I broke down, and a quantity of pus made its escape externally.

The operation gave instant relief, and the progress afterwards, although slow, has been practically uneventful.

The case is, I think, noteworthy, on account of the age of the patient and the rapidity with which the abscess formed, as the foal was apparently well two days previously.

AN OSTEOMA IN A PECULIAR SITUATION.

BY J. L. PERRY, M.R.C.V.S., CARDIFF.

The patient, an aged roan mare pony, had an unsightly enlargement on the inner side of the upper third of the off hock. It was hard and slightly moveable, and did not cause lameness, having taken about twelve months to attain its present size. It was cone-shaped, with its flat end opposed to the surface of the hock, and it had a soft spot in the centre, from which, when explored with a trocar, a quantity of dark thick blood exuded. An operation was advised, and the tumour was excised under chloroform, great care being taken to avoid the under parts.

The excrescence was afterwards boiled, and when cleaned was found to be a hollow shell with a wall of bony material and a roughened inside surface, with sharp spicules projecting from several places. The wound healed well, but five weeks after the operation a hard swelling again showed itself. This has not, however, increased to any detrimental size, although before the operation the enlargement was so great that it interfered with the opposite limb.

The tumour was sent to Sir John McFadyean, and he pronounced it to be osteoma, stating, too, that it was most unusual to get one in this situation.

AN INTERESTING TERATOMA OF THE TESTICLE.

BY W. J. TURTILL, VETERINARY SURGEON, ASHBOCKING.

In April last I was called upon to operate upon a yearling colt, the animal being a cryptorchid. When I found the missing testis in the abdomen, I at once noticed that it was larger in size than usual, and abnormal to the touch, being extremely hard. In order to obtain its removal, I was compelled to enlarge the abdominal ring to a considerable extent, after which I had no difficulty in getting it away, and the patient made an uninterrupted recovery.

The specimen was sent to Dr. Shattock, the Curator of the Royal College of Surgeons' Museum, and this gentleman proclaimed it to be a teratoma, stating that it contained cartilage and a few cysts lined with stratified epithelium, of which the deeper cells were prickly, and the deepest held fine pigment granules.

A CASE OF SATURNINE EPILEPSY.

BY HENRY B. EVE, M.R.C.V.S., FOLKESTONE.

The patient was a valuable Chinchilla cat, aged about 2 years, and always kept in the house when not confined in a cattery. It had got its coat covered with fresh paint, and in attempting to clean itself it had licked a considerable quantity into its system. When I was called in I found the animal very dejected, arching its back, and when attempting to walk, knuckling over at the fetlocks. The head was depressed, the coat staring, and the conjunctiva injected; whilst the gums and tongue were of a livid colour, and the latter organ was continually protruded. The pulse was quick and hard, the respiration accelerated, and the temperature raised.

The animal was continually grating its teeth and salivating freely. It was constipated at first, and then had a fœtid diarrhœa. Rigors were observed, together with colicky pains, and there was complete arrest of the urinary secretion.

Progression was only made with difficulty, the hind parts being particularly unsteady. At times the animal would be half comatose, and at other times would dash its head about violently.

The treatment consisted in getting rid, as far as possible, of the remainder of the paint from the body, and internally administering strong saline purgatives.

These were followed up by small doses of diluted sulphuric acid every four hours.

For three days the dietary consisted of Brand's Essence, Valentine's meat juice and white of egg.

Finally, small doses of potassium iodide were given; and to my intense satisfaction, and I may almost say, surprise, the patient made an excellent recovery.

A RUPTURED LIVER.

BY R. MACGREGOR, M.R.C.V.S., MARKET HARBOROUGH.

On Tuesday afternoon, May 1, about 2.30, I was called in to see a pony, aged about 14. The history was that he had been suffering from colic from about 10 a.m., but had got better after receiving a sedative draught. He had another bad attack about 2 p.m., so the owner decided to send for me. When I arrived I found the pony in a box, lying down. I stood and watched him about five minutes; the only sign of pain was looking round to the off-side now and then. I decided to examine him, and made him get up. He got up as usual, but had not been on his feet half a minute when he started to breathe heavily, staggering about the box and running with his head against the wall. I could not get near him to examine him. After about twenty minutes the symptoms abated. Pulse imperceptible, temperature 109° F., mucous membrane blanched, mouth and tongue ditto. My diagnosis was that of internal hæmorrhage, and that the animal was dying. After about an hour the pulse was better, but I couldn't count it. The patient was inclined to eat a little, the membranes still very blanched; I gave a drink of linseed oil, ol. tereb., and chlorodyne. At 11 p.m. there was no change, except that the pony kept turning head back to right side now and then. I diagnosed ruptured liver with capsule intact.

May 2, 3, and 4.—Membranes still blanched, pulse better, temperature 100°; eating grass and carrots. The bowels acted tolerably well.

May 5.—Mucous membranes becoming pink; everything apparently going on well.

May 6.—Mucous membranes yellow, but pony feeding and seemingly doing well.

May 7.—11 a.m. Looking well. Had just finished my examination, when he fell down in pain and died in half an hour.

The *post mortem* examination revealed the abdomen full of blood; the bowels were all right; the liver very fatty and ruptured in two places. One place contained a large blood clot, which, I think, was the original seat of the trouble.

My friend, Mr. Haywood, F.R.C.V.S., Leicester, went with me one day to see the case, and I told him my diagnosis, which was verified on *post mortem* examination.

FRACTURE OF THE OS PEDIS IN A MULE.

BY LIEUT. W. E. SCHOFIELD, A.V.C., MIDDLEBURG, TRANSVAAL, SOUTH AFRICA.

WHEN first seen by me, this case presented the appearance of a very bad case of quittor.

The animal refused to put any weight on the near hind leg, the coronet was very much inflamed, and the wall of the inside quarter was separated from the coronary band and the sensitive foot; in fact, the whole of the hoof appeared to be sloughing off.

Previous History.—I found that the mule had picked up a nail a short time previously, which had penetrated the sole on the inside quarter near the point of the frog. The puncture had apparently healed up, but the animal continued lame.

Treatment.—I immediately removed as much of the under-run horn as I could, which resulted in the whole of the frog, the greater part of the sole, and a considerable portion of the wall being taken away.

I now discovered the original puncture made by the nail that had been picked up, which penetrated the sensitive sole, and from which a considerable quantity of thick white pus was oozing.

I explored the puncture, and took from it a piece of the pedal bone an inch and a half in length by an inch in breadth, together with several other much smaller pieces.

The foot was then treated with antiseptic dressings and bandaged. In a day or two all discharge had ceased, the portion of the wall which had become separated (the whole of which I had not removed in order to give the mule something to stand on) united again with the sensitive wall, and the animal made an uneventful recovery. It is now as sound as ever it was, and there is no indication of false quarter, as the coronary band was not injured.

DIVISION OF THE GASTROCNEMIUS TENDON OF A DOG AND RECOVERY BY ADHESION.

BY. S. M. WOODWARD, M.R.C.V.S., SHEPHERD'S BUSH, W.

THE subject, an Irish terrier, was brought for treatment, in January last year, for a punctured wound above the near hock, caused by a stab from a stable fork. During the act of progression the point of the hock of the injured limb was brought close to the ground. On examining the wound, the divided ends of the gastrocnemius tendon could be distinctly felt. The animal was chloroformed, and, with every aseptic precaution, the small wound was opened up, the divided ends of the tendon brought together and sutured. The stitches did not hold, however, so the wound was opened up again, the stitches removed, and no re-suturing of the tendon attempted. A plaster cast was made of the front of the sound hind leg, which acted as a mould for a piece of sheet gutta-percha, and so a splint was made for the injured limb, being kept in place by a bandage, and the area of the wound left exposed.

After seven weeks' treatment the animal was discharged from the infirmary. The ends of the tendon could still be felt, though the space between them was much less, and the hock was not brought so near to

Photograph showing the almost normal appearance of the right gastrocnemius tendon.

the ground during progression. At the present time the injury to the tendon can be felt as a thickening only. The animal is sound, and there is little, if any, difference between the two points of the hocks and their relative distance from the ground.

THE MALTA MILK FAMINE.

MALTA is at present in the throes of a milk famine, writes our correspondent, due to a strike among the goatkeepers, which has resulted from the Governor's attempt to extirpate Malta fever. The goat is the main source of the island's milk supply, and the insanitary conditions under which it is often kept have been under the consideration of the authorities for some time. As a result of the recommendations of the Mediterranean Fever Commission the Civil Government has lately issued bye-laws compelling goat-owners to provide healthier and better accommodation for their animals. The bye-laws also empower the sanitary officials to inspect premises where goats are kept, and to obtain, free of charge, samples of milk for analysis. It is the exercise of the last named powers that has caused the present trouble. Thousands of gallons of good milk are being thrown away daily, and there is a consequent boom in the numerous brands of the tinned variety at higher prices than those usually obtained.

(*Burton Chronicle.*)

A NEW METHOD OF PREVENTIVE INOCULATION AGAINST FOOT AND MOUTH DISEASE.[1]

SOME years ago Professor Loeffler prepared a preventive serum by injecting horses with increasing doses of a virulent lymph which is to be found in the vesicular eruptions of sick animals. With doses of from 10 to 20 cc. of this serum hogs and sheep are perfectly protected against infection for from four to six weeks. The duration of the immunity produced by the serum was found to be much shorter for the bovine species, because the serum of a horse, foreign to the body of a bullock, is eliminated in a comparatively short time. By treating bullocks cured of the illness in the same manner as horses with increasing doses of lymph, Professor Loeffler obtained a preventive serum that was also excellent for the bovine species. But as it was not possible to cultivate artificially the infectious agents of the malady, it was necessary to obtain the required lymph drop by drop from the infected animals. That is why the price of the serum is somewhat high. To immunise animals in as inexpensive a manner as possible it was necessary to find a method of active immunisation with an attenuated lymph.

Last year Professor Loeffler published an account of such a method. A certain amount of virulent lymph mixed with a certain quantity of preventive serum was injected under the skin. The best results were obtained from this mixture of $\frac{1}{25}$th cc. of virulent lymph and half a cc. of preventive serum. Three weeks after the injection of the mixture the injected bullocks supported $\frac{1}{100}$th cc. of virulent lymph. Fifteen days later an injection of $\frac{1}{100}$th cc. of lymph, and after another fifteen days $\frac{1}{25}$th cc. of lymph, was given. Then only had the animals acquired an immunity that enabled them to resist the disease itself. This method did not cost much, but it was necessary to inject the animals four times to reach the required degree of immunity.

These repeated injections gave rise to many practical difficulties. Therefore another effort was made to discover a method by which one single injection would suffice. Professor Loeffler succeeded in finding this method in the following manner. It was not possible to cultivate the infecting agent artificially; it had to be cultivated in the body of animals susceptible to the disease. The disease of the bullock is transmitted to the bullock by means of the lymph taken from the vesicles; then after three or four inoculations the lymph no longer produces any effect. The inoculated animal does not become ill. The result is the same if the inoculations are from hogs to hogs. The series of inoculations become more lengthy if bullocks and hogs are inoculated alternately. The only animal in the body of which the virus may be preserved is that of a sucking-pig aged about five or six weeks.

In trying the lymph obtained from sucking-pigs on bullocks it was observed that the bullocks, which are really more susceptible to this disease than hogs, stood rather strong doses of this lymph—$\frac{1}{25}$th or even $\frac{1}{10}$th cc.—without contracting the disease. The lymph, therefore, was attenuated in its virulence, so far as its action on the bovine

[1] Abstract from the Report of the Special Commission of the *Lancet* to the fifteenth International Congress of Medicine (Lisbon, April, 1906).

species is concerned. Unfortunately, this attenuation was not of a stable nature, but it became stable if cultivated in sucking-pigs of the same race. After an injection of $\frac{1}{25}$th cc. of this lymph the bullocks obtained an immunity that was well marked and durable. To avoid any risk or danger of infection, the animals inoculated with the lymph received at the same time an injection of a small quantity of preventive serum, from 10 to 20 cc., under the skin and in some other part of the body. This new method was tried on several dozen bullocks at the experimental station of the Institute of Hygiene at Greifswald.

Apart from the practical consequences, the scientific importance of the experiments consists in that the infecting agent of one disease attacking two different kinds of animals can be attenuated in its virulence for the one kind of animal because it has been cultivated only in the other kind of animal. By artificial cultivation in the bodies of one sort of animal the agent adapts itself to that species, and is rendered less likely to infect the other species. Thus it is possible to profit by this agent attenuated in the first species to make with it preventive inoculations in the second species, even though the latter is by nature much more susceptible to the disease than the first species.

Thus we have here a certain analogy with vaccination. The infecting agent of small-pox is transmitted to the calf, and is cultivated in the body of the calf. By this process it is so modified that it only produces in man a local pustule. That is why it is possible to make preventive inoculations in man against small-pox. There is an analogous relation between human and bovine tuberculosis. The bacillus of tuberculosis, cultivated naturally and frequently in man, loses its virulence for the bullock, and the bacillus cultivated constantly and naturally in the bullock loses its virulence for man. Thus we may profit by the human bacillus to make preventive inoculations in bullocks against the bovine bacillus, and *vice versâ*, probably it will be possible to immunise man with the bovine bacillus against infection from the human bacillus.

The important result of the new researches in regard to inoculations to prevent foot and mouth disease is, then, a fact verified experimentally. It is possible to obtain a vaccine by adapting artificially the agent of a disease attacking two species, cultivating for some time this agent in the body of one species and inoculating with the other species.

(*The Lancet.*)

PART III.* OF THE REPORT OF THE DEPARTMENTAL COMMITTEE APPOINTED BY THE BOARD OF AGRICULTURE TO INQUIRE INTO THE ÆTIOLOGY, PATHOLOGY, AND MORBID ANATOMY AND OTHER MATTERS CONNECTED WITH THE DISEASES OF SHEEP KNOWN AS LOUPING ILL AND BRAXY.

Copy of Minute of Appointment of Departmental Committee as to Louping-Ill and Braxy.

I hereby appoint:

Professor D. J. Hamilton, M.B., F.R.C.S.E., of Aberdeen University;

J. McI. McCall, Esq., M.B., C.M., M.R.C.V.S., Assistant Veterinary Officer, Board of Agriculture; and

E. G. Wheler, Esq. Alnwick Castle;

to be a Committee:—

(*a*) To report as to the ætiology, pathology, and morbid anatomy of the diseases of sheep known as Louping Ill and Braxy;

(*b*) To make experimental investigations as to the bacteriology and life history of these diseases, and as to their communicability, either directly or indirectly from animal to animal;

(*c*) To bring together the results, if any, of the work of investigation at home or abroad; and

(*d*) To indicate the directions in which preventive or remedial measures are likely to be successful.

And I hereby appoint Professor D. J. Hamilton to be Chairman, and R. B. Greig, Esq., F.H.A.S., F.Z.S., of the Durham College of Science, Newcastle-on-Tyne, to be Secretary and Demonstrator to the said Committee.

(Signed) R. W. Hanbury,
President of the Board of Agriculture.

4, Whitehall Place, London, S.W.,
December 12, 1901.

Note.—At a subsequent date the employment of Mr. J. McL. Young, F.R.C.V.S., Lecturer on Veterinary Hygiene, University of Aberdeen, and Mr. A. H. Berry, F.R.C.V.S., Superintending Veterinary Inspector, Board of Agriculture and Fisheries, to assist in the work of the Committee, was sanctioned by the Board.

GENERAL SUMMARY FOR THE USE OF FLOCKOWNERS AND FARMERS.

Parts I. and II. of this report contain an exhaustive account of the work of the Committee, and of the diseases in question.

It has been considered desirable, however, by the Committee to append a general summary for the benefit of those who may not be able to follow the technical details, but who desire a brief statement of the results of the investigation.

Owing to the fact that veterinary surgeons are rarely consulted with regard to sheep diseases, little trustworthy information could be

* Part I. (General Report) and Part II. (Details of Investigation) are published separately as [Cd. 2934], price 3½d, and [Cd. 2935], price 4s., respectively.

found relating to louping-ill; but, with reference to braxy, the committee had the advantage of Professor Hamilton's previous researches, which began in 1881, and were continued subsequently under the auspices of the Highland and Agricultural Society of Scotland.

The particulars of these researches were embodied in a paper published by him in the Society's transactions for 1902.

Before proceeding to describe the work and results of the inquiry, it may be well to refer to what is generally known about louping-ill and braxy among flockmasters and shepherds in the hill-districts of Scotland and the borders.

Louping-Ill.

General Features of the Disease.

Area.—Louping-ill appears to be confined to the British Isles. It is very prevalent in the West and South of Scotland and the North of England. It is also reported to be fairly common in parts of the North-West coast of Ireland.

Mortality.—The mortality caused by louping-ill under normal conditions, although it may rise as high as 50 per cent., does not commonly exceed 20 per cent. even in the worst districts. If, however, sheep are moved from "clean" or healthy to "foul" or infected ground, it is well known that excessive mortality is likely to be the result.

With regard to both louping-ill and braxy, "foul" ground may be sharply divided from that which is "clean" by a fence, a stream, or other boundary.

Animals subject to the disease.—Sheep are subject to louping-ill at all ages, but more especially during their first year, and other animals, such as cattle, pigs, and even geese are occasionally attacked.

Symptoms.—Shepherds are not always able to distinguish louping-ill from other diseases, and most sheep dying or found dead on infected farms in the spring months are supposed to have died from louping-ill.

The disease takes two forms, chronic and acute. In the former, the sheep is usually convulsed at first, and afterwards more or less paralysed, lying sometimes for weeks unable to rise. The appetite may not fail entirely, and ultimate recovery, though very rare, is possible, but one or more of the limbs, it is said, may be permanently crippled, and the sheep may have to be killed in consequence. In acute cases the disease runs its course to a fatal issue in a few hours, with symptoms of blood poisoning.

Ticks.—In many districts ticks are commonly supposed to be, in some unexplained way, the cause of the disease, and this view has been accepted by certain scientific investigators. It is, however, almost entirely negatived by the researches of the Committee, which show that, at most, ticks can carry infection only under exceptional and accidental circumstances.

Braxy or Sickness.

General Features of the Disease.

Area.—Braxy is found over a wide area of country. It is said to exist in Cornwall, and to a lesser extent in the West of England. It is more prevalent again in the South of Scotland, and is endemic*

* Endemic :—Confined to a particular district.

throughout the most of the West Highlands, its area of greatest intensity. It is said to prevail along the West Coast of Ireland, and is very severe in Iceland, the Faröes, and the West Coast of Norway. Professor Hamilton points out that wherever the influence of the Gulf Stream is felt, braxy may be found. A disease resembling it, and which may be identical with it, is said to infest certain areas in New Zealand. It is also reported from Mecklenburg-Schwerin.

Mortality. — This is the most terrible scourge among sheep in this country, and at its chief centres, the West and South of Scotland, the death-rate is often 20 per cent. among the first year's sheep, and may at times amount to almost total annihilation.

Age of sheep attacked.—Sheep under 1 year (called hoggs in Scotland and tegs in the south) are the chief sufferers from braxy. It commonly attacks those that are in the best condition, and the mutton is eaten with impunity by shepherds, their dogs, and other domestic animals.

Symptoms.—The disease runs its course with remarkable rapidity, and, in fact, the first intimation is generally the finding of the dead animal. Putrefaction appears to set in immediately after death. Under natural conditions, therefore, opportunity is seldom afforded of studying its symptoms, but all accounts seem to agree in describing the first symptoms to be a short, quick step, followed by unsteady gait, and a tendency to lie down and get up suddenly.

The above particulars describe generally the information that was to be obtained when the Committee commenced its researches in 1901. Previous to that date the cause of louping-ill had not been discovered, but in this country the bacterial character of braxy had been established by Professor Hamilton, who confirmed the discovery of the specific bacillus by Ivar Neilsen in Norway in 1888.

Investigations of the Committee.

Louping-Ill.

The work of the Committee was much facilitated by the liberality of the Duke of Northumberland, who provided convenient accommodation at Keilder, on the North Tyne, in the heart of a district affected by louping-ill. The investigation commenced in the spring of 1902, and the farmers of the districts afforded every assistance by sending their dead or dying sheep for examination. During the whole of this season, beyond disposing of many previous misconceptions, the results were mostly of a negative character.

Diseases confounded with louping-ill.—It was found during this period, however, that the symptoms were so alike with those in several other diseases as to render it next to impossible to distinguish them. Farmers and shepherds were equally at fault, and cases of pyæmia, malignant œdema, sturdy, blood-rot, and spinal abscesses were brought in, believed to be louping-ill. It was only after the discovery of the specific bacillus at a later period that cases of louping-ill could be diagnosed with certainty.

In some cases of louping ill the symptoms were so closely allied to those of tetanus (lock-jaw) that at one period of the inquiry it was supposed that louping-ill was simply a modified form of that disease, especially as one phase of the bacillus showed a remarkable resemblance to the bacillus of tetanus. After thorough investigation, however, the conclusion was arrived at that not only is this erroneous,

but that sheep do not appear to be naturally subject to tetanus. Contrary to expectation, not a single case of anthrax was encountered in the sheep.

Absence of apparent cause of disease.—A difficulty arose through the absence of any specific signs of disease in most of the carcases of the sheep brought to us, though the *post-mortem* examinations were most thorough and painstaking. Sheep after sheep was killed and examined, only to show that all or nearly all the organs were healthy, and with the exception in most cases of some excess of liquid in the peritoneal cavity,* there was nothing to attract attention. The blood was free from any organism, and all inoculations made with it failed to convey the disease from one sheep to another.

A bacillus in the peritoneal liquid.—Microscopical examination of the peritoneal liquid led to the discovery that though sometimes apparently free from any organism, at other times it swarmed with a large bacillus. It was noticed that when this bacillus was present in small amount the liquid was clear, but when in any quantity the liquid assumed a turbid aspect. At first it was thought that two diseases, characterised by clear and by turbid liquid respectively, existed side by side, but it was found later on that the clear liquid, if incubated for twenty-four hours, also became turbid from the presence of the same organism. The cause of the disease proved identical in both cases, but when, instead of the malady being allowed to run its course, the sheep was slaughtered, the bacillus had evidently not had time to propagate in sufficient numbers to render the liquid turbid, or even to enable it to be discovered by microscopic examination.

The bacillus is a large rod with a great tendency to develop spores, these being oval or round and of a brown colour. The rods show feeble motility and propagate both by fission and by formation of spores.

Inoculation.—It is usually in a sporing condition within the peritoneal liquid when removed from the carcase, but by the end of twenty-four hours' incubation the number of spores increases, and if after this procedure the liquid be inoculated subcutaneously into a healthy sheep it usually kills the animal in a few hours, and with much swelling of the limb inoculated. The probability of conveying the disease successfully was found to be greatly increased by injecting simultaneously a little acetic acid, a procedure previously known to enhance the action of the bacillus of blackquarter. The experiment of conveying louping-ill by inoculating healthy sheep with the peritoneal liquid or with a culture of the bacillus found within it was successfully repeated again and again. The bacterial character of the disease was thus definitely established.

Point of entrance of the bacillus.—It was for a long time an enigma how the bacillus reached the peritoneal liquid. Eventually a lamb was brought in having all the typical symptoms of louping-ill in an acute form. Before death it was unable to stand, and, when supported, the limbs trembled violently and were thrown into spasms. It seemed in a dazed condition, as if suffering from blood-poisoning. The *post-mortem* examination revealed the fact that, although the tissues and

* The peritoneal cavity is that formed by the lining membrane of the belly or abdomen.

cavities of the body were free from the bacillus, the intestine swarmed with it, and thus a clue was obtained as to its natural habitat.

Germs swallowed when feeding.—Following this discovery, it was made out by a long series of experiments that the bacteria or their spores, which latter are almost indestructible by natural influences, are taken up by the mouth when feeding, and thus pass into the alimentary canal. Here they remain and multiply, being evacuated in quantities with the dejecta, but not necessarily injuring the animal.

Action of healthy sheep's blood upon the bacillus of louping-ill.—A very remarkable discovery was subsequently made with regard to susceptibility and immunity. It was found that if the blood of a healthy sheep were placed in a test tube, a culture of the louping-ill bacillus added to it, and the mixture incubated at the body temperature with exclusion of air, very opposite results were obtained at different seasons of the year. If this were done in the spring, during the louping-ill season, the organism, as a rule, grew freely upon the blood, while at other times of the year the converse usually took place—the blood destroyed the bacillus. A period was eventually reached, in July and August, when this bactericidal action of the blood became complete and invariable.

The same remarkable fact was found to apply to the bacteria of a number of allied diseases to which further reference will be made.

Nature and cause of louping-ill discovered.—A clue to the nature and cause of the disease has now been obtained. During certain months of the year the louping-ill bacillus may apparently reside and multiply in the alimentary canal without occasioning any injury to the sheep. The wall of the stomach and of the intestine forms a complete barrier to its passage into the peritoneal cavity or into the tissues. This seems to be due to the blood exerting an influence inimical to its growth at these particular times. When the dangerous period, viz., the spring time, approaches, owing to the blood failing in its power to destroy the bacillus, this protective influence is lost, and the organism, if now picked up by the sheep for the first time, is able to pass the wall of the intestine with facility. If such be the case, the growth in the peritoneal liquid will be luxuriant, the liquid turbid from the multitude of bacteria present, and the sheep will die with symptoms of blood poisoning.

It can well be imagined, however, that there may be many cases where the power of the blood is not so completely lost, and that under such circumstances the invasion of the cavity would be much more gradual. A condition of chronic poisoning would then be established, the poison acting slowly on the nerve centres and paralysing them. This gives rise to the second kind of case, where the disease seems to run a chronic course, and where nervous symptoms are manifested. It is in this type of the disease that the peritoneal liquid is usually clear, and the bacilli so few as to be unrecognisable under the microscope until their numbers have multiplied by incubation.

*Immunity naturally acquired.**—Those sheep which, when grazing, pick up the organism during the season when they are not susceptible (viz., when the blood can destroy it) usually allow of its passage along

* Immunity—by this is meant the fortifying of the animal against an attack of the natural disease.

the intestine without detriment, and are evidently thus rendered immune, so that when the period of danger arrives they fail to take the disease.

Susceptibility.—On the other hand, sheep which pick up the organism for the first time during the dangerous period (viz., when the bacillus can grow upon the blood) have little power in resisting the passage of the organism into the peritoneal cavity, and, consequently, many of them fall victims to the disease.

This theory accounts (1) for the larger death-rate among lambs and hogs; (2) for the excessive mortality which occurs when sheep are brought from "clean" on to "foul" ground during the spring months.

It may be mentioned that there is no evidence to show that louping ill is infectious in the sense of a fever. Very few, if any, sheep take it a second time; it is doubtful whether those which apparently do so have not previously suffered from some other complaint having symptoms more or less resembling those of louping-ill.

Braxy and Allied Diseases.

It had previously been suspected that various diseases passed under the name of braxy, and this proved not only to be the case, but, further, it was discovered that louping-ill, braxy, and several other diseases as yet only partially examined, form a most interesting and important group, closely allied, all acquired through the fodder, all caused by anærobic bacteria,* whose habitat is in the alimentary canal, and all of which are subject to the peculiar seasonal action of the blood, described above under Louping-ill. Referring to the group, the Report, Part II., p. 329, says: "The side issues that have cropped up show how little the diseases to which sheep are liable are understood—how much, in fact, they are misunderstood—and what necessity there is for more extended and trustworthy knowledge of their nature and cause. From a pathological point of view, they are a perfect mine of wealth, are fraught with scientific problems of the highest interest and importance, and are most suggestive of what may turn out to be a new light on the pathology of many of the contagious and infectious diseases of man and of the lower animals."

Characteristics of the group.—So far as is yet known, the group in question comprises the following:—

Animals Naturally Susceptible.

	Sheep	Cattle	Swine	Deer
Braxy or Sickness	X	—	—	—
Louping-ill	X	X	X	—
Black-quarter	X	X	—	—
Struck	X	—	—	—
Malignant Œdema	X	?	?	?
Disease "A"	X	—	—	—
Disease "B"	X	—	—	—
A peculiar Disease of the Deer	—	—	—	X

* Anærobes are a class of bacteria so called because they can grow only in media om which the air is excluded.

"Struck" is a disease well known on Romney Marsh, where it is very fatal. It has lately been pronounced by Professor McFadyean to be black-quarter of the sheep. The investigations of the Committee, however, favour the view that it may be a distinct though closely allied complaint.

The disease described in our Report as "malignant œdema" is certainly another of the same group, but whether it is the disease commonly known by that name is yet an open question.

Diseases "A" and "B" are so called because their identity is still doubtful. They have hitherto been supposed by shepherds to be various forms of braxy, and have been called locally "red braxy," "white braxy," "water braxy," &c.

The "deer disease" appears again to be distinct. It is fatal in the early spring to the deer in Alnwick Park, Northumberland, and will no doubt be found to exist elsewhere.

The chief characteristics common to the members of the group are, so far as yet known, as follows:—

They occur at definite seasons of the year.

They are more or less confined to certain farms and districts.

The carcases have a strong typical odour.

They are each caused by a specific anærobic bacillus resident in the alimentary canal.

The bacilli in the whole of them are destroyed by the blood of the sheep during the summer months, and to a less degree at other times of the year, but during the "season" peculiar to each they grow with more or less facility upon it.

They all, probably, may be prevented by a method of drenching which is described further on (page 10).

Seasons.—The seasons of the year during which these diseases are most prevalent are respectively:—

Braxy	November to February.
Louping-ill or trembling ...	April to June.
Black-quarter	Spring and autumn.
Struck	Early spring.
Malignant œdema... ...	November to January, and May to June.
Disease "A"	September to middle of December.
Disease "B"	October to January.
Deer disease	End of winter and early spring.

Districts.—The districts infested by the various diseases have not yet been sufficiently investigated. The following must be held as conveying a general idea only:—

Braxy	Widely distributed along the West Coast of Great Britain and Ireland (*see* Part II., page 13).
Louping-ill or trembling ...	West of Scotland and North of England.
Black-quarter	Widely distributed.
Struck	Romney Marsh.
Malignant œdema... ...	Scotland and North of England.
Disease "A"	West Highlands and South of Scotland.

Disease "B"	West Highlands and South of Scotland.
Deer disease	Alnwick Park, Northumberland.

Characteristics of Bacteria.—The accompanying statement will give a general idea of some of the chief differences in the appearance of the specific bacterium in each :—

Braxy	Small delicate rods, immobile and with a great tendency to spore.
Louping-ill...	Large, thick, clumsy-looking rods, slightly motile.
Black-quarter	Thick rods, more motile than those of Louping-ill.
Struck	Very large coarse-looking rods.
Malignant Œdema ...	Long thin rods, very actively motile, movement snake-like.
Disease "A"	Very large rods with feeble motility.
Disease "B"	Long thread-like rods. Motionless.
Deer disease	Extremely long, thin rods. Motionless or only slightly motile.

The report shows that these characters change so much under different conditions of culture that it is only by a most careful comparison of their varying features, particulars of which may be gathered from the exhaustive series of observations detailed in the report, that any conclusions can be arrived at regarding the identity of the species.

It is remarkable that the respective organisms are commonly found in almost pure culture in the intestine and abdominal cavity, other bacteria being generally absent or in abeyance.

Bactericidal Action of Healthy Sheep's Blood.—The action of the blood in destroying the bacteria of Louping-ill and Braxy at certain seasons of the year, described in Part II., Section XXVI., was found to apply to other members of this group of diseases. The several seasons of immunity or susceptibility during which the blood proved bactericidal or the reverse, varied, as might be expected, with each disease. The periods of complete immunity, as shown by the experiments, were :—

Braxy	July and August.
Louping-ill	July and August.
Black-quarter... ...	July and August.
Struck	July and August.
Deer disease	May to August.

Conversely the seasons during which the blood of the sheep affords an excellent medium of culture for the respective organisms of the various diseases were found to be as follows :—

Braxy	October to end of January.
Louping-ill...	April to June (not sharply defined).
Black-quarter	End of January to end of April (partially).
Struck	From January to end of April (so far as ascertained).
Deer disease	From January to end of April (so ascertained.)

It should be mentioned, however, that the experiments from which these results were obtained did not extend over a length of time sufficient to complete the particulars in the cases of "Struck" and the "Deer disease."

During the intermediate months the growth of the bacteria of the various diseases in sheep's blood is sporadic and uncertain, but as a rule is prohibited.

Preventive Treatment.*

A long series of experiments was conducted to discover if louping-ill and braxy could be prevented by subcutaneous inoculation of their bacilli. Full particulars of the experiments will be found in Part II. It is enough to say here that this method of procuring immunity by injecting the culture under the skin was found to be uncertain and unsatisfactory. The organism not being introduced into the intestine —its natural *habitat*—but inoculated subcutaneously, often produced results which were violent and sometimes ended in the death of the animal.

At times this method failed entirely to confer immunity, and, whether successful or not, it enfeebled the sheep, causing uneasiness, lameness, and loss of condition.

Drenching.—The natural *habitat* of this group of bacteria being the intestine, and the fact of the diseases due to them being acquired by feeding, suggested the idea of "drenching" or introducing the organism by the mouth in preference to the method of subcutaneous inoculation.

The results have proved eminently satisfactory. No pain, uneasiness, or loss of condition has been noticed, and, as will be shown by tabulated summaries of the preventive experiments, in every way the new method has proved successful. These results were arrived at gradually. There were numerous failures, largely owing to ignorance of the seasonal variation of the blood which was discovered only in 1904. The extraordinary success of the subsequent preventive measures proves the importance of the discovery. Great danger may be incurred by preventive treatment at the wrong time of the year, as the animal being then in a susceptible condition, the disease may be communicated and death ensue.

The Drench.—The drench which proved so effective was prepared

* *Pigs' Dung Treatment*—A curious and fairly successful treatment of sheep as a preventive against braxy has a wide reputation and is much employed by hill-shepherds.

A pig is turned out on foul ground, or fed on grass from infected pastures. After three days the dung is collected and mixed with new milk in the proportion of one pint of dung to fifteen pints of milk. The sheep are allowed to fast for twelve hours, and are then drenched with a wine-glassful of the mixture. The time of administration is the third week of September, before the braxy season has commenced. Crude and uncertain as the treatment is, it appears to be founded on a true principle, namely, that of introducing the disease germs acquired by the pig into the alimentary canal of the sheep before the disease has manifested itself. Microscopical examination of the dung showed the presence of an abundance of sporing bacilli which, on being inoculated under the skin of a sheep, killed it within a day or two. The carcase of the inoculated sheep was swarming with a bacillus which in general configuration resembled that of disease "A." One objection to the method of treatment must always be the uncertainty of knowing what particular organism or organisms are present in the pig's dung at the time of its administration.

by incubating the specific bacteria on glucose-beef-tea, a small quantity of which mixed with water was administered to each sheep by the mouth, a second dose being given a week to a fortnight later.

The drenching experiments were confined to braxy and louping-ill, but there is no reason to anticipate that successful results will not be obtained by similar methods of treating the other diseases of the same group.

The following are summaries of the various series of preventive experiments by drenching only :—

LOUPING-ILL.—PREVENTIVE EXPERIMENTS.

First Series of Experiments by Drenching made in June, 1903.

No. of Sheep Treated	Deaths from Louping-ill	Deaths from other Diseases
10	None	None
Second Series of Experiments in March, 1904.		
175	2 or 1·14 %	2 or 1·14 %
Third Series of Experiments in December, 1904, *and January*, 1905.		
1,340	1 or 0·07 % (A doubtful case)	26 or 1·9 %

It should be noted that the second series of experiments was made so late in the spring that the louping-ill season had almost begun. The loss amongst 177 sheep that were treated by *inoculation* at the same time was 24, or 13·5 per cent., showing the superior efficiency of the drenching method.

BRAXY.—PREVENTIVE EXPERIMENTS.

First Series of Experiments by Drenching made late in Autumn, 1903.

No. of Sheep Treated	Deaths from Braxy	Deaths from other Diseases
34	None	3 or 9 %
Second Series early and late in Autumn, 1904.		
1,545	9 or 0·6 % (At least 3 doubtful)	144 or 9·3 %

Some of these braxy experiments were carried out too late in the autumn, viz., in September, October, and November. It is, therefore, doubly surprising that the mortality from this disease was reduced to such a low figure. When it is considered that the sheep treated in both sets of experiments were on land notoriously foul, where in many cases a death-rate of 20 per cent. would be thought low under normal conditions, and that in some instances sheep were deliberately

moved from "clean" to "foul" land to increase the severity of the test, the results both from louping-ill and braxy are satisfactory beyond anything that could have been reasonably expected. There seems, in fact, to be no reason why absolute immunity may not be secured against both diseases, provided proper precautions are taken. So far as has yet been ascertained, sheep so drenched are rendered permanently immune.

Of the 144 deaths from other diseases in 1904-5 :—

44	were from disease	"A."
23	,,	,, "B."
44	,,	malignant œdema.
2	,,	louping-ill.
28	,,	unidentified, but not braxy.
3	,,	accidental causes.

Multiple Immunisation.—It will be noticed that the greater proportion of the deaths in the above list were from diseases which are allied to louping-ill and braxy.

Comparing these results with those obtained from undosed sheep from the same farms and pastured side by side with those treated by us, the results are very striking. Thus out of 45 undosed cases from which we received the peritoneal liquid, the deaths from braxy came up to 19 or 42·2 per cent., the others being accounted for by the various allied diseases above enumerated.

We state in Part II. (page 328) of our report :—The question "whether an animal may be immunised to several of these diseases at once is a matter of which we have little experience. The only experiment we made on the subject, and the only evidence we possess relative to it, is with regard to louping-ill and braxy. To 25 sheep we administered a mixture of a culture of the braxy bacillus and that of louping-ill in the early autumn. The farm on which they were pastured claims a high mortality from both diseases, but, notwithstanding, not a single death occurred among them."

The passage quoted continues : "This subject of *multiple immunisation* through the intestine opens up a field of research fraught with the most profound practical issues, and of which nothing at present is known. Indeed, the whole subject of immunising through the intestine is one which has bearings of a far-reaching character relative not only to diseases of the lower animals but also to those which are peculiar to man."

It may be well to state that while the manufacture of the cultures of the louping-ill and braxy bacilli must be left in scientific hands, the cost of preparing and the trouble of using them are but small details compared with the value of the lives which they promise to save.

In conclusion, it must be repeated that this Part III. is merely an outline of the work done; those who are interested in the details are again referred to Parts I. and II. for full particulars.

Conclusions.

Braxy and louping-ill form two of a group of specific bacterial diseases.

There is some amount of similarity in the symptoms of certain of the diseases of this group.

This similarity frequently results in errors of identification.

The primary habitat of the bacteria which are their cause is, in the whole of them, the alimentary canal.

At certain seasons of the year the blood of the sheep is unable to resist the invasion of these bacteria, and death ensues.

At other seasons the blood of the sheep destroys these bacteria, and at such times the animal is proof against them.

The germs of this group of diseases are picked up by the animal when feeding.

The fatal effect of these germs in the case of louping-ill and braxy may be prevented by drenching with a culture of the respective bacilli during the period of resistance.

If the drenching be done at a wrong time of year, viz., during a period of susceptibility, death may follow as a result in a certain number.

It has yet to be shown whether drenching methods will succeed with the other diseases of the group, but the evidence, so far as it goes, tends to show that not only is this the case, but that immunity may probably be secured against two or more of them at the same time.

Suggestions.

The Committee suggest:—

That the above facts be made widely known in the infected districts.

That facilities be given for the universal drenching of sheep against Louping-ill and Braxy, where these diseases prevail.

That in view of the prevalence of other diseases allied to Louping-ill and Braxy, further opportunities should be granted for the investigation of these and of the methods of preventing them.

In conclusion, we beg to acknowledge our deep indebtedness to Mr. R. B. Greig, not only in his capacity of Secretary to the Committee, but also for many other services performed in furtherance of the inquiry.

We also desire to express our appreciation of the valuable assistance we obtained from Mr. J. McL. Young in the carrying out of our experiments, and for the excellent advice he gave the Committee in the management of the animals employed.

(Signed) David James Hamilton (*Chairman*).
James McI. McCall.
E. G. Wheler.

R. B. Greig (*Secretary*).
April 10, 1906.

THE LIVE STOCK INTEREST OF AGRICULTURE AND ITS RELATION TO VETERINARY SCIENCE.*

BY HON. FRANKLIN DYE, SECRETARY STATE BOARD OF AGRICULTURE, TRENTON, N.J.

A Paper presented to the Veterinary Medical Association of New Jersey at its Semi-annual Meeting at Washington Park, N.J.

An intelligent consideration of this subject requires a knowledge of the number and value or our live stock; the essential character of this industry to the growth and prosperity of other industries, and the

* Abstract from the *American Veterinary Review.*

necessity of preserving the health of our domestic animals, because of their money value, and especially lest, through disease, they become a menace to human health.

As reported by the United States Department of Agriculture, January 1, 1905, the number, average price and total value of farm animals in the United States are as follows: The number of horses in the United States is 17,057,702, valued at $1,200,310,020 ($70.37 per head). The number of mules, 2,888,710, value $251,840,378 ($87.18 per head); milch cows, 17,572,464, value $482,272,203 ($27.44 per head); other cattle, 43,669,443, value $661,571,308 ($15.15 per head); sheep, 45,170,423, value $127,331,850 ($2.82 per head); swine, 47,320,511, value $283,254,978 ($5.99 per head).

In the following table for New Jersey please notice the higher value per head of the same stock in this State as compared with the average value for the United States:—

						Difference
Horses ...	94,278	Value	$9,293,580	Per head	$98.58	$28.21
Mules ...	4,974	,,	564,316	,,	113 45	26.27
Milch Cows ...	184 618	,,	7,261,026	,,	39 33	11.89
Other Cattle ...	79,599	,,	1,591,732	,,	20.00	4.85
Sheep	43,344	,,	188,841	,,	4.36	1.54
Swine	15 ,988	,,	1,570,275	,,	10.40	4.41
	557,801		$20,469,770			

Here is a money value at a low estimate of twenty and a half million of dollars, equal to $590.76 for every farm in New Jersey (I take it that the above table does not include horses in cities).

To take care of the health of these animals, we have in round numbers three hundred and fifty veterinarians scattered here and there throughout the State. This would give one veterinarian to every ninety-nine farms, if so many of them were not located in the cities. Jersey City and Hoboken, Newark and the Oranges alone, have over one hundred veterinarians located within them. This leaves for the farms and the other cities and towns about one veterinarian for every one hundred and forty farms. However, all of our veterinarians are subject to call both in city and country as occasion may require. And it is for this Association to determine whether we have enough good veterinarians in New Jersey at the present time.

The fact that such an Association as this exists and that laws have been enacted within recent years requiring special education for the practice of veterinary science shows that the profession is aspiring to a larger usefulness and a just dignity among the other professions.

Turning now to my second proposition—(the essential character of this industry to the growth and prosperity of other industries): divested of our live stock, what would our farms be worth? They could not all be devoted to truck farming, and even if they were, the faithful horse would be needed both in field work and in transportation. And it is worthy of remark in this connection that, notwithstanding the advent of bicycle, trolley car and automobile, horses are higher in value per head than they have ever been before. He is not only the beast of burden in city and country, but also the motive power, *par excellence*, for pleasure driving.

Nor can we eliminate the foster mother of humanity, the dairy cow and her progeny, from our business world. Should we do so, the

manufacturers of nursing bottles, milk bottles and cans would go out of business. Cream in your coffee at your hotel would be a greater luxury than it now is, and beefsteak and onions for the hearty veterinarian would be a thing of the past. No, we cannot spare the noble horse nor the motherly, benevolent cow. Nor will the Jew or Gentile be willing to forego the roast lamb from their diet, and most of us Gentiles have a fellow feeling for the hog.

Without going into details, the merest reference to the place these animals hold in our national economy as food products and in other ways justifies the assertion that without them other industries, with which they are not so closely identified as they are with agriculture, would be seriously crippled, and the daily diet of their workers would of necessity be greatly curtailed.

The preservation of the health of our domestic animals because of their money value is an important consideration. What the annual loss by unchecked disease, accident, &c., to the domestic animals of New Jersey is, I have no means of knowing, but it is no inconsiderable sum. What it would be without the checks put upon it by the application of veterinary science and skill may be suggested, if we ask to what extent would anthrax spread and what would be its ravages if unmolested. Or suppose we allow glanders free spread among our horses, when and where would it stop?

Or ignoring the possible effects of (the sometimes slow-working) tuberculosis among our dairy animals, take no interest in securing those conditions that contribute to health, while preventing disease, nor even remove diseased animals from our dairy herds. What, in a short time, would be the condition of those herds and what the character of their product? And with pleuro-pneumonia, foot-and-mouth disease, and many others.

It is in this connection that I wish to emphasise the importance of my fourth proposition: diseased animals a menace to human health.

While some human lives are not worth much to their generation and others an absolute detriment, yet, ordinarily, one human life is worth more than many animals; and diseases of animals should not be allowed to assail the human race if it is possible to prevent it. That it is possible to do so, the investigations and practice of veterinary science, in the more recent years, have clearly demonstrated.

As we consider this phase of our subject, either by itself or in connection with the points previously named, the high mission of the veterinary profession appears, and the necessity for an education that combines scientific study with practice. Not only a money value, but human health and human life, are also associated in the preservation of the health of our domestic animals.

The profession should give more attention to poultry. According to Secretary Wilson, of the United States Department of Agriculture, "The hens of the country, during their busy season, lay enough eggs in two weeks, at the high prices of eggs that prevailed during the year, to pay the year's interest on the National debt."

The poultry and egg product of New Jersey is more than $2,000,000 annually. If the diseases of poultry were understood so as to be controlled, the above-named sum would be greatly increased.

Our veterinarians should also be able to give the farmers points on breeding for improvement of farm stock. We need now 75,000 well-bred cows to take the place of the same number of our herds that pay no profit.

The science of breeding should be better understood by stock-breeders, and educated veterinarians are in a position to help it on among the farmers. Thus a stronger bond of good feeling would prevail between the veterinarian and the farmer.

The farmers have a pecuniary interest in an efficient veterinary science, holding as they do 600,000 head of stock, exclusive of poultry, with a value of twenty and a half million of dollars. It is to their interest, in all cases of serious disease amongst their animals, to immediately call for the services of their veterinarian. Delay frequently means the loss of valuable stock.

For this service they are, or should be, willing to pay a fair compensation, and as promptly, at least, as they pay their family physician.

The consumers of meat and milk also have a deep interest in the question of a healthful food supply and, as our intelligent veterinarians are associated with the producers of these products in preventing or curing diseases that may affect their healthfulness, they, the consumers, have an indirect interest in maintaining a high grade veterinary service.

Owing to the necessity of preserving the health of our domestic animals, *because of their money value and especially lest, through disease they become a menace to human health*, an efficient veterinary service is required: and all that can be done to raise the standard of efficiency in the profession should be encouraged.

POISONING OF CATTLE BY "JAVA" BEANS,

In connection with the cases of poisoning by "Java" beans which were abstracted from the *Journal of the Board of Agriculture*, and reported in the previous issue of this Journal, Professor McCall, of Glasgow Veterinary College, carried out some experiments with samples of the bean meal used in one case. The material was given to a collie dog, a Shorthorn cow, and a black and white colt, with the result that they all died, the dog within two hours and the cow and horse within one hour of the first appearance of the symptoms.

A noticeable feature in the experiments was the period of time which elapsed, namely, fifteen or twenty minutes, between the ingestion of the Java meal and the appearance of toxic symptoms. The explanation is that the poison does not exist in the form of free hydrocyanic acid in the beans; but the elements are there, and on the addition of moisture and heat (both of which are furnished by the stomach) a chemical combination occurs resulting in the slow and gradual production and liberation of the deadly poison.

When these conditions are produced artificially outside the body the formation of the poison goes on gradually for several days.

It is frequently stated that when the Java meal is boiled the volatile poison is driven off and that the meal can then be used with impunity. In the experiment with the cob, however, the meal was boiled in water for one hour, and the result showed that boiling cannot be regarded as a safeguard.

A quantitative analysis of the Java meal revealed the fact that in each pound of meal there were nine maximum doses of prussic acid for an adult.

In a paper on the poisonous properties of these beans submitted to the French Academy of Science by M. Guignard, it is mentioned that in March, 1905, a consignment of "*Feves de Kratok*" arrived at Rotterdam which was composed of one or more varieties of *Phascolus lunatus*, and that four persons were poisoned by these beans. In November and December last, beans of the same description, sold as "Java" beans, were the cause of numerous losses among horses, cattle, and pigs in Hanover. More recently still some dozen cases of poisoning have been reported from Belgium among animals fed on the beans or on the bean meal, which in the majority of instances had been cooked. Beans of this character have also been offered for sale in France—at Paris, Lyons, and Marseilles.

ADULTERATION OF FEEDING STUFFS.

Two prosecutions have recently been undertaken by the Herefordshire County Council under the provisions of the Fertilisers and Feeding Stuffs Act, 1893. In once instance a substance described on the invoice and on the label as "best pea-meal" was analysed and found to be largely adulterated with fine sharps or with a similar finely ground offal from wheat. There was a deficiency in albuminous compounds, which are an important element in pea-meal, and it was considered that not more than one-half the sample was pure pea-meal. A fine of £15, including costs, was imposed.

The second instance dealt with the sale of a substance invoiced as "white maize meal," which on analysis proved to consist of only two-thirds genuine maize, the remainder being rice husks which were worthless for feeding purposes. It was deficient in albuminoids, and contained a great excess of indigestible woody fibre. A feature of the defence in this case was that the description on the invoice was a clerical error, and that the meal was not sold as "maize meal" but as a patent American meal. The "sale note" was produced in support, with the result that the case as regards the invoice was dismissed, but a fine of £10, including costs, was imposed for selling the meal without disclosing the fact that it contained an ingredient worthless for feeding purposes.

(*Journal of the Board of Agriculture*).

A HUMANE ENACTMENT.

A LAUDABLE decision has been arrived at by the prefecture of the Ottoman capital with the view of protecting horses from misuse and ill-

treatment. The Turks are on the whole very kind to animals and shield them from injury by every possible means. At almost every Turkish house in Stamboul there is to be found a small receptacle where water is poured in every day for the use of the innumerable street dogs. A Mussulman, building his dwelling place, rarely forgets some contrivance for sheltering birds, pigeons, sparrows, &c. I am assured that a cabman who overruns a dog, heedlessly enjoying its *dolce far niente* in the middle of the street, has to pay a fine of several piastres, while the Sultan is believed to spend a large sum on the feeding of the numerous canine scavengers around his kiosks and palaces. There are, however, a good many employers of horse labour who use their animals in a cruel or thoughtless manner. To prevent this the employment of senile, debilitated, or diseased horses has been forbidden. Municipal agents will have difficulty in Constantinople in insuring that the measure is strictly adhered to—that the load never exceeds the amount proportionate to the horse's strength, and so on—but anyhow the spirit which has influenced the new enactment is laudable.

(*The Lancet.*)

Translations and Extracts.

REPORT ON CONTAGIOUS DISEASES IN GERMANY FOR 1904.

THE losses in animals that have died or been slaughtered for contagious diseases have risen to £400,000. The greatest losses have been from swine plague, £175,000; rouget, £125,000; black quarter, £50,000; glanders, £25,000. These figures represent the value only of the animals destroyed or dead. If the loss of condition in the survivors, cost of disinfection, disturbance of markets, &c., be taken into account, the loss will be infinitely greater.

The compensation paid for glanders was £12,300, and for pleuropneumonia £950.

Cases of charbon, rabies, glanders, foot-and-mouth disease, equine mange, and rouget, are reported as having been communicated to man. Nine hundred and thirty-one persons were prosecuted for infringement of the sanitary laws.

There were 5,959 cases of anthrax, against 4,626 in 1903, viz., 4,571 cattle, 114 sheep, 177 horses, 88 pigs, 12 goats, and 123 human beings, of whom 4 were veterinary surgeons, 22 butchers, and 3 knackers, 10 died.

Of black quarter there were 1,666, against 1,111 in 1903, with 7 recoveries.

In Bavaria 8,499 calves were vaccinated, with 4 deaths from vaccination and 19 from charbon.

Rabies, 1,047 cases, against 920 in 1903, viz., 889 in the dog, 101 cattle, 14 cats, 12 horses, 12 sheep, 12 pigs, 1 goat.

Glanders, 461, against 313 in 1903. The disease has been several times imported from Russia, Austria, and Luxemburg.

Foot-and-mouth disease: 51,395 oxen, 33,727 sheep, 23,793 pigs,

and 692 goats. The disease was imported from Russia, Austria, Switzerland, and France. Three cases in man are reported.

Contagious pleuro-pneumonia; a single case is reported from the public abattoir of Coblenz.

Coital exanthemia, 6,894 cattle, 165 horses.

Scab, 57,985 cases, against 70,331 in 1903.

Rouget, 57,789, against 89,087 in 1903, chiefly in Konigsberg, Posen, and Bronberg. Vaccination by Lorenz's method is used with success. Three cases in man are reported.

Swine plague is increasing to an alarming extent; 89,890 cases, against 73,655 in 1903, with 64,882, or 72 per cent., deaths. It was chiefly prevalent in Schleswig, Breslau, and Marienwerder.

Fowl cholera, 46,952 cases, against 83,065 in 1903.

Fowl plague, 2,757 in the Black Forest, Dresden, and Marienwerder.

Of the cattle imported from Denmark, 92,188 were subjected to the tuberculin test, with 849, or 0·9 per cent., reactions, whereas in 89,440 animals slaughtered, tuberculosis was discovered in 20,125, or 20·5 per cent.

(*Bearbeitet im Kaiserlichen Gesundheitsamte zu Berlin.*)

UNUSUAL CASE OF ACTINOMYCOSIS IN A COW.

BY ELOIRE.

THE case occurred in a cow which was one of fifteen being stall-fed. The animal appeared to be in perfect health, but on April 14 she was noticed to have a tumour the size of a fowl's egg on the left side of the face. It was hard and painless, and as it was supposed to be only an abscess following an injury, but little notice was taken of it beyond rubbing it with camphor ointment.

From April 19 to 24 there was no improvement. On May 6 the cheek was hard, thick and painless, the skin being covered with scales. When the swelling was punctured only blood escaped. When the mouth was examined there was nothing to be seen internally, and as the diagnosis was uncertain, nothing but the local application of iodine was prescribed.

On May 29 the cow was greatly emaciated, but the temperature remained normal, and from 24 to 26 litres of milk were given daily. The The tumour had greatly increased, extending to the lower part of the chin, filling up the groove and extending to the right side. The maxillary bones were not implicated, but both paratoid glands were hard, swollen, and adherent to the surrounding tissues. The movement of the jaws was impeded, and mucus containing particles of food escaped from the mouth. The swelling extended to the lower part of the neck, and the head was enormously enlarged. The case being hopeless, the animal was destroyed.

On June 2, a few minutes before slaughter, the temperature was 38·5 C., and in spite of having travelled 10 kilometres, and having fasted for twelve hours, the cow gave 10 litres of milk. The measurements

of the head were—from the nape to the nose, 58 cm.; circumference just above the eyes, 1·10 m.; circumference just below the eyes, 1·10 m.; weight with skin, 38·500 kilos.

The viscera were healthy, but there was extensive actinomycosis of the molar and buccal glands, but the tongue and bones were healthy.

A *post-mortem* examination was made by Professor Moussu, of the Alfort Veterinary College.

The disease commenced by diffused swelling of the lower part of the head. The cheeks were enormously enlarged, the lips thickened, and the commissures thickened and indurated. The bones were absolutely healthy. The skin was tense, hard, rigid, and without any folds or wrinkles, and quite inelastic. The subjacent tissue and buccal membrane were in the same condition. Owing to the slow development of the disease the movements of the jaws was not greatly interfered with.

At first sight the case looked like one of scleroderma or elephantiasis of the face. Scleroderma, however, is uncommon in cattle, and is confined to the skin and corresponding divisions of the nerves. A longitudinal section of the head was made, and the bones, cartilages, tongue, and teeth were healthy. In places the skin over the jaws was 2 cm. thick, the muscles white and fibrous, the upper and lower molar glands hypertrophied, and consisted of a number of red or brown lobules, isolated from each other by inflammatory tissue and infiltrated with yellow serum. The buccal glands were increased in size and were as hard as a stone, and the mucous membrane dense and rigid, but without abrasions or ulcerations. In the substance of the buccal tissues from the chin to the eyes were a number of hard yellow fibrous nodules, varying from the size of a grain of sand to a hazel nut, from which a smegma could be squeezed containing grains of actinomyces, in which the parasite could be recognised on microscopic examination. This form of actinomycosis might easily be mistaken for actinobacillosis, but can be distinguished from tuberculosis by the peripheric sclerotic indurations, which are characteristic. The sound condition of the buccal membrane leads one to suppose that the channel of infection was through the buccal glands.

(*Oesterreichische Monatsschrift für Tierheilkunde.*)

NOTES ON THE VALUE OF NEUROTOMY.

THE opinions of one hundred and eighty-one veterinary officers of the French Army were asked as to the practical value of this operation. Seventy-nine were in favour of it as a means of relieving certain lamenesses, and prolonging the working career of the animal for a longer or shorter period.

Of the remainder, thirty condemned it, fifteen were doubtful, forty-one did not perform the operation, and sixteen did not reply. The result is, that out of one hundred and eighty-one military veterinary officers only seventy-nine are in favour of it.

It would therefore appear that in the French Army neurotomy does not give the good results that certain authorities have claimed for

it, and that it should be only had recourse to as a last resource, and even then the relief afforded is only temporary.

From the answers received it would seem that in the light cavalry the operation is in discredit; out of forty-five corps only nine favourable answers being given.

In the artillery and transport the majority of answers were favourable, which seems to show the results are more favourable with draught than riding animals.

From the heavy cavalry and various military schools the answers were more favourable, but when the statistics come to be examined a large number of animals operated upon were not real troop horses, but employed in carts and other such services.

Median neurectomy is more in favour; out of two hundred and seventy-six the results were favourable in one hundred and seventy-nine, bad in eighty-one, and doubtful in ten, so that the results may be taken as favourable in two cases out of three; but the time the service of the animals was prolonged is not mentioned.

(*Recueil d'hygiene et de Médécine Vétérinaire Militaire.*)

POISONING IN HORSES, CATTLE AND PIGS, BY BEANS CONTAINING HYDROCYANIC ACID.

DRS. DAMMAN AND BEHRENS.

THE effects of hydrocyanic acid on the lower animals have chiefly been studied from an experimental and physiological point of view, but accidental cases are rare, those recorded being in cattle, sheep and goats that have been fed on peach, almond and plum leaves, cherry stones, &c., and geese fattened with damaged nuts.

The authors have seen several cases of hydrocyanic acid poisoning in herds and studs where the animals were fed on foreign beans. The animals, a short time after feeding, were attacked with vertigo, getting up into the manger with the forelegs, tympanitic, and falling over on the side. In nearly all cases the result was fatal.

The suspected beans had been imported by a Hamburg firm. They appeared to be quite sound, were not worm-eaten, and contained very little foreign matter. They were divided into eight samples, according to their colour.

When placed on wet cotton-wool, the smell of bitter almonds was given off about the second day. Blotting-paper impregnated with sulphate of copper and tincture of guaicum, suspended over the beans, turned a blue colour.

Water wrung from the cotton wool, boiled with a mixture of ferrous and ferric salts, and the sediment dissolved in hydrochloric acid, gave Prussian blue. With the addition of sulphate of ammonia, and after evaporation to dryness, a few drops of hydrochloric acid were added to the residue, and a drop of perchloride of iron formed sulphocyanate of iron of a blood red colour. Both these tests denoted the presence of hydrocyanic acid.

Experiments were then made with injection and feeding on the suspected material. For the former, 125 grammes of the bean-meal

were macerated in 250 grammes of water. The different solutions furnished from 1·1 to 1·4 per 1,000 of hydrocyanic acid, which, used in doses of 0·5 cc., 0·2 cc. and 0·1 cc., killed mice in a few minutes.

Feeding experiments were made on rabbits, sheep, pigs and a cow, and gave positive results. The beans were *Phaseolus lunatus*, *P. vulgaris*, a *Dolichos* that was not determined, and *Cajanus indicus*. It should be remembered that if the reaction of sulphate of copper and tincture of guiacum is sensible, it is not absolutely characteristic of hydrocyanic acid, as ammonia, ozone, bromine and iodine, give the same reactions. The other two tests, however, are conclusive evidence. It has been proved that the changes that take place in certain glucosides give rise to the formation of hydrocyanic acid under certain conditions.

(*Deutsche tierarztliche Wochenschrift.*)

INVERSION OF THE UTERUS IN A COW; AMPUTATION AND RECOVERY.

BEN DANOU.

THE uterus had been inverted for four days, and was the size of a child's head, and of a dark violet colour. The general condition of the patient was good, although the temperature rose to 39°C. The extruded uterus was amputated by an elastic band, and the part disinfected with boracic acid and permanganate of potash. The cow was not at the time in calf. She made an excellent recovery.

(*Journal de Médécine Vétérinaire et de Zootechnie.*)

CHRONIC STRING-HALT IN THE HORSE.

BY PROFESSOR R. BOSSI, DIRECTOR OF THE TURIN VETERINARY SCHOOL.

THE author, for a considerable time, has made a special study of string-halt in the horse and other animals, with the object of ascertaining if relief could be given by surgical interference, and articles were published by him in 1872, 1875, 1879, and 1885, in *Il Medico Veterinario*, and in 1897 in *Il Moderno Zooiatro*.

He now publishes three further cases, which appear to confirm the opinions he published in 1897, viz.:—

(1) That in horses and cattle there is a form of chronic string-halt due to sudden displacement of the patella over the inner border of the femoral trochlea beyond the normal limits. This displacement is identical with cramp, but differs in the period of duration. This form of string-halt is distinguishable from all the others by the creaking noise of the patella when the limb is moved, by the way it is moved, and the fact that it is always curable by division of the internal lateral ligament. This form of string-halt is only seen in the horse.

(2) In the horse there is a second form that accompanies chronic dry arthritis of the back. In this there is no creaking noise of the patella, and the gait is peculiar and characteristic in the way the thigh

is flexed, and in the fetlock when the foot is brought to the ground. In this form section of the tendon, aponeuroses or ligaments is indicated.

(3) A peculiar form described by Hertwig as being "retraction of the inner muscle of the fasciæ lata." The author has seen two cases, which he successfully operated upon, dividing the muscle.

(4) Nervous string-halt depends on diseased conditions of the nerve centre and is seen in all the domestic animals, especially dogs. This form is generally associated with chronic lumbago, either rheumatic or traumatic (which in reality is chronic myelitis); it is also a symptom of locomotor ataxy. Both hind limbs are affected, there is no creaking noise, and operative interference is useless.

(5) There is no doubt that in many cases string-halt is cured or relieved by section of the peroneo prephalangian muscle, but, on the contrary, in the author's hands it has, in other cases, been a failure.

(6) Professor Dieckerhoff considered that there was an idiopathic form of string-halt, due to irritation, followed by contraction and shortening of the aponeurosis of the thigh, especially the anterior portion that descends in front of the thigh and hock and unites on the metatarsus with the tendon of the anterior extensor of the phalanges. He recommends section of that portion of the aponeurosis that descends to the thigh, and at the same time tenotomy of the lateral extensor of the phalanges.

The author points out that there are six forms of string-halt in horses, some curable, others incurable, and that it is most important that the clinical aspect of these should be better studied, and then goes on to mention his three new cases, in all of which surgical interference was successful.

Case 1.—String-halt in a donkey. Double sciatic and anterior tibial neurotomy.

The animal, an aged mare donkey, was purchased on March 25, 1904, as a dissecting-room subject; she had string-halt of the off hind, which showed itself at a walk, and resembled that form designated "low string-halt" by the author, which often accompanies dry arthritis of the hock in horses. At each step the limb was raised and then flexed in an exaggerated manner by an extremely rapid movement, which was more pronounced when the animal was turned upon a small circle. The movement consisted of an exaggerated flexion of the hock, whereas in string-halt of the stifle there is flexion of the thigh upon the pelvis and the foot is brought up almost to the abdomen. When the foot was brought to the ground the pastern was semi-flexed, the toe only being in contact, and the pace was very short; but the animal was not lame, although she had a spavin on the off hock.

The diagnosis was dry arthritis of the off hock, with spavin, and low string-halt.

It was resolved to perform sciatic and anterior tibial neurotomy, as proposed by Bossi for the treatment of dry arthritis of the hock. The operation was performed on March 28. The animal was thrown on the right side, and the near hind-leg drawn up and fastened to the fore one with a side-line; the off hind also being secured with another. The skin on the inside of the thigh was disinfected in the usual manner, and an incision two inches long made between the body of the deep flexor of the phalanges and the tendo Achillis, parallel to it, four fingers' breadth from the point of the hock, as the animal

was a small one. The lips of the wound were held apart by retraction, the aponeurotic tissue incised, the connective tissue dissected away, and the large ischiatic tissue exposed. About three-quarters of an inch were excised, the wound closed with three sutures, and again disinfected.

The animal was again turned over on her near side, the skin shaved and disinfected on the outside of the thigh, about four fingers' breadth below the external malleolus of the tibia, and anterior tibial neurectomy performed. In this case the position of the nerve was abnormal, overriding the vein of the same name, instead of being a little way from it. About three-quarters of an inch of the nerve was removed, the wound closed with four sutures, and again disinfected.

The donkey was allowed to get up, and at a walk there was no trace of string-halt, even when turned on a small circle.

On April 8, *i.e.*, ten days after the operation, the animal was sound, and showed no signs of string-halt on the off hind, only a slight difficulty in raising the leg, even when turned in small circle.

As the double operation was successful in this case, the low string-halt undoubtedly was a symptom of dry arthritis of the hock.

Case 2.—Low string-halt in a horse. Tenotomy of the lateral extensor of the phalanges.

The patient, a six-year-old gelding, was brought to the Turin Veterinary School, suffering from string-halt in both hind limbs, more in the off, and which had been in existence for about six months.

There was nothing abnormal to be seen about the stifle-joint, and when the horse was walked, and the hand placed over the part, there was no crackling sensation which is characteristic of stifle stringhalt. At a faster pace there was quick and exaggerated flexion of the hock, especially well marked when turned short on the hind-legs, the foot being brought down to the ground with violence, resting on the toe, and the pastern semi-flexed. There were spavins on both hocks, but no lameness.

The diagnosis was low string-halt, from either dry tarsal arthritis or retraction of the lateral exterior of the phalanges muscle. As the case was doubtful, it was decided first to treat it for arthritis, and on January 9 both hocks were blistered, but when again seen on the 25th there was no improvement.

The hocks were then puncture fired, but, on the twentieth day after, there was no improvement, and it was decided to perform tenotomy on both lateral extensors of the phalanges, which was done subcutaneously.

Directly after the operation there was no improvement, but on the sixth day there was, and the owner was advised to give him light work. This he did, and reported shortly after that even during the journey of twenty-five kilometres to his home the string-halt had diminished and gradually disappeared.

The patient was seen at the commencement of April, and was then quite well.

From this case it would appear that tenotomy of the lateral extensor of the phalanges is indicated in these forms of low string-halt that are not caused by dry arthritis of the hock-joint.

Case 3.—Stifle-joint string-halt in both hind limbs. Section of the tibio-patellar ligament.

The animal, aged 8, was an Hungarian gelding that did light harness work. He came under the author's notice at the beginning of October, 1905, having bad string-halt in both hind-legs. This had been in existence for some considerable time, according to the owner's account. The string halt was of the patellar variety from displacement of the bone over the internal trochlea of the femur beyond the natural limit. This displacement is identical with cramp, except that it is instantaneous and the latter more prolonged. It is distinguishable from the other forms, being accompanied by a peculiar crackling sound, by the foot being jerked suddenly upwards and forwards, the hip being violently flexed on the haunch, and the thigh on the hip, so that the fetlock nearly touches the belly. The period in which the foot is on the ground is longer than when it is raised, and the whole of the foot is also on the ground, as the pastern is extended on the cannon bone. When excited, the movement in this case was so exaggerated that the horse appeared to move with a series of jumps, like a rabbit, and was only able to progress with difficulty. Needless to say, the animal was nearly useless, and an operation was resolved upon as advised by Cadiot and Pfeiffer ("Manuels de Chirurgie Operatoire"). The operation was performed on the morning of October 9, in the usual manner, the internal tibio-patellar ligament and aponeurotic fascial being divided in both hind limbs. On rising the string-halt still remained, but the movement improved. The animal was given complete rest for nine days till the wound healed, when he was taken out. Only a very slight irregularity remained when turned sharply. At the end of October he was discharged cured and has been since working at a trot and going sound.

The author considers that the three forms of string-halt caused by dislocation of the patellar, retraction of the lateral extensor of the phalanges muscle, and dry tarsal arthritis, are all curable by operation.

(*Revue Générale de Médeciné Vétérinaire.*)

ANALGESIA OF THE SPINAL CORD BY THE USE OF TROPACOCAINE IN VETERINARY PRACTICE.

BY DR. TORRI.

As the practitioner of veterinary medicine has generally to operate single-handed, general anæsthesia is not universally used, as is the case with human beings.

The injection of cocaine into the spinal canal to produce anæsthesia of the lower (posterior) limbs, which was advocated in human medicine, has been abandoned on account of the serious results that took place.

Tropacocaine is an alkaloid prepared from the leaves of the Java coca, and the hydrochlorate, which is in the form of white crystals, soluble in water, is the salt most commonly used in medicine. It is a local anæsthetic, and is not any more powerful than cocaine, but is quicker in its action and does not give rise to ischæmia. It can be used in a solution directly applied to the mucous membrane, or hypodermically in a 10 per cent. solution, but should not exceed this strength.

In poisonous doses it paralyses the respiratory system, and in very large ones the heart. It has a certain degree of antiseptic action, a solution remaining unaltered and active for three months. An aqueous solution locally applied will cause a smarting sensation, but this disappears on the application of a 5 to 6 per cent. solution of chloride of sodium. In ophthalmic surgery a 2 to 3 per cent. solution is used, which has a more powerful anæsthetic effect than cocaine, but is not so lasting.

The performance of the operation is simple. In the horse it is performed standing, with a twitch on and the fore-leg held up; in small animals lying on the side and secured by an assistant. The site of the operation is the point of junction of a line running down the centre of the spine and a second one drawn between the two internal angles of the ilium. In the ox the point is the centre of a triangle, the apex of which is the first superior spinous process of the sacrum, and the base a line uniting the two antro-external processes of the ilium. In the carnivora, Baldoni recommends the centre of a triangle, the apex of which is the posterior edge of the superior spinous process of the last lumbar vertebra, and the base a line meeting the most prominent part of the border of the antro-internal angle of the ilium.

An ordinary hypodermic syringe with a strong needle of sufficient length is used for large animals, 2 millimetres in diameter by 17 centimetres in length, and for small animals 1 millimetre by 10 centimetres.

The spot where the puncture is made is carefully disinfected, and the syringe, held like a pen, is pushed into the spinal canal. When the canal is penetrated an escape of the cephalo-arachnoid fluid will take place, which can be recognised by its yellow colour sometimes stained with blood. There is also a sensation of resistance of the tissues being overcome communicated to the hand. The barrel of the syringe is then screwed on the needle and the injection slowly made.

Anæsthesia of the hind quarters takes place in from three to four minutes, and lasts from one to two hours. The author claims to have performed with the aid of tropacocaine various operations, such as neurectomy, quite painlessly; and the doses he uses are: Rabbit, 5 centigrammes, dog 10, and large animals 20, in a 10 per cent. solution of distilled water; but he has given as much as 10 to a rabbit and 18 to a dog without any ill-effects. In this instance anæsthesia lasted from three to eighteen hours. A large quantity of fluid should not be used, as an accident from pressure on the spinal cord might take place.

The author gives four diagrams showing the point of puncture, and considers that on account of the facility with which the injection can be given and the cheapness of the drug that its use should become extended in veterinary surgery.

(*Il Nuovo Eriolani.*)

New Instruments and Appliances.

NEW PARTURITION INSTRUMENTS.

SUGGESTED BY W. D. BLANCHARD, M.R.C.V.S.

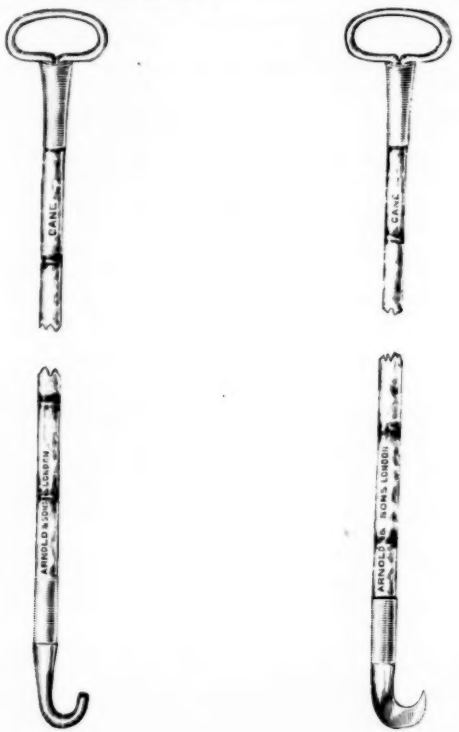
MESSRS. ARNOLD & SONS, of West Smithfield, London, have made for me a set of parturition instruments which embody certain improvements that I am sure every country practitioner will recognise.

Being flexible, one can pass over any intervening portion of the fœtus; the manipulation is done by the hand outside, directing only being left to the inserted hand.

Injury to operator or patient is reduced, and one's arms are not bruised as with steel.

If the hand becomes cramped, it can be opened without dropping the instrument, and from the fact that they are controlled from the outside nothing like so much strain is put on the arm inside, and as the hand is inserted with the fingers extended, or nearly so, it does not cause the mother to strain so violently as do the knuckles when the hand is doubled up grasping an instrument.

In those cases where the head is the offending member the blunt hook will be found of great service.



Take the case of a mare in which one can just reach the orbit with the fingers extended; the ordinary long hook, with its rigid shaft, is generally useless, the knees or fetlocks in the passage prevent the hook reaching the place, even if the pelvis does not bar the way. The flexible shaft of this hook will overcome the difficulty, and further, the size and angle of the hook is such that it can be inserted without difficulty when it reaches the eye.

Or, again, in those cases in which the head is forward, but lying on its side or turned over in that peculiar position the operator knows so well. It was cases of this description which made one try to find some means of relieving the strain one was put to in trying to get up the head. To pull at the head from the orbit lying uppermost is only to make matters worse; trying to lift and turn over the head with the hand is often trying to lift the cow, and a cord on the jaw assisting often pulls away.

I found that when I could insert the long hook in the lowermost eye, as well as the cord on jaw, I could generally pull out the head, especially if the fœtus could be pushed back a little; hence my trying to get an instrument which was flexible as well as strong, and these instruments will stand pulleys attaching.

I never use any other knife in embryotomy than the long sharp hook on the skin that has been separated by the subcutaneous spatula. I feel for the top of the scapula, then, inserting the knife (and being laid flat on the fœtus and held there with the extended fingers, there is no danger to operator or patient, the handle outside enabling one to keep the point turned in one direction), I take the knife to the top of the shoulder, and turning the point and pressing through the skin withdraw the knife. It will be found that a clean cut no deeper than the skin will be made throughout the length of the limb. It will not stick into the shoulder or elbow joint in passing over as the usual hook does, the angle of blade and size accounting for this, and in those cases in which there is absolutely no room these advantages become obvious.

I trust that others may find these instruments as useful as I have; in my case they have become indispensable.

Correspondence.

To the Editor of The Veterinary Journal.

THE NEW REGULATIONS FOR THE OFFICIALS OF THE BOARD OF AGRICULTURE.

Dear Sir,—In your editorial in the May number of your valuable Journal, on the action of the Board of Agriculture in reorganising its veterinary staff, you say much which is to be commended, but I think a few words may be said from another point of view.

I suppose no one will dispute the advisability of employing the best available men (at the price) in any public department. It redounds both to the credit of the profession involved and to the

public benefit, but I suppose the Juggernaut of progress never did roll on without leaving its trail of victims behind. And it is so in this case.

It will be noticed that an examination on all professional subjects —including Tropical Medicine—is synchronical with the examination in the Acts and Orders of the Board of Agriculture for all temporary veterinary inspectors wishing to obtain a position on the permanent staff, and that (with the exception of a short time in London, during which the intending candidate will be afforded opportunities of attending post-graduate classes) *the work has to be carried on at the same time.* I am quoting from memory, but I feel pretty certain that the failures to pass the Acts and Orders examination ALONE by the lay staff is something like 12 per cent., and the candidates are public school and 'Varsity men practically to a man; yet we of the veterinary staff are required to undertake both preparations *at once!!*

We are not all of us Heaven-born geniuses—nor, for the matter of that, men of such exceptional ability, industry, and perseverance as the ordeal placed before us would appear to demand, *even supposing one's age and seniority allow of one's going up for the examination at all*—and, to my mind, it is distinctly "hard lines" that a man who has worked to the best of his ability for the Board for a number of years should be cast aside, like a worn-out "trooper," just at the age (45) when other employment is nowadays practically impossible to obtain, and when (through specialising in contagious diseases) he has practically lost the greater part of his operative and manipulative dexterity, and the gentle art of prescribing is in the limbo of the past.

I am, Sir,

Yours very truly,

June 13, 1906. "PIG-STICKER."

THE NECESSITY FOR A RELIABLE INSPECTION OF IMPORTED MEAT.

To the Editor of THE VETERINARY JOURNAL.

SIR,—The horrible description given in the American and English papers of the insanitary and criminally careless methods of meat inspection as carried out in the Chicago stockyards and preserved meat establishments (so much of whose products are imported to England), has re-opened again the question of the necessity for a properly guaranteed system whereby the public shall be protected against the numerous illnesses and diseases which can be transmitted through eating improperly tinned or other preserved foods. The Chicago establishments appear to have been universally condemned, not only by the Commissioners appointed by President Roosevelt to enquire into the matter, but also by the correspondent of the *Lancet* (as quoted in the April number of the VETERINARY JOURNAL) and by most of the daily American and English lay papers.

In a recent issue of one of the daily papers, a comparison is drawn between the meat imported from New Zealand and that imported from Chicago, the words used being as follows:—

"The revelations made during the last few days as to the horrors of the stockyards and the foul garbage put on the market by the wealthy syndicates of Chicago, have for the time being paralysed the trade in tainted 'dainties,' such as 'tinned tongue, 'brawn,' and 'breakfast delicacies.' It has been shown that no rubbish is too repulsive and unwholesome for sale.

"Sam Weller's pieman, who made mutton, veal, and ham or beef-steak pies out of cats, was a man of delicate scruple and fastidious honesty compared with these wealthy American trusts. He, however, had forestalled the great principle on which Chicago acts: 'It's the seasoning as does it.' Any filthy animal refuse is used, but its nature is concealed by a plentiful supply of salt, a strong flavouring solution, with a touch of cochineal red.

"The enormous extent to which the British people are affected may be best gauged from the following official figures. During 1905 there were imported to Great Britain from the United States:—

	Cwt.
Bacon	2,755,233
Beef (fresh)	2,232,206
Beef (salted)	135,277
Hams	1,022,855
Mutton (fresh)	6,283
Pork (fresh)	135,233
Pork (salted)	72,528
PRESERVED MEATS.	
Beef	321,908
Mutton	4,394
Various	107,072

Making a grand total of 6,792,989 cwt., or about 339,649½ tons!

"Between the prices charged for this nauseous rubbish and those for frozen meat from New Zealand, the difference is infinitesimal. All meat arriving from New Zealand is above suspicion, and is perfectly palatable. The same cannot even be said of the fresh meat imported from America."

The tribute to New Zealand is well deserved, and it is the result of the fact that that colony possesses a well organised system of meat inspection, *entirely under the control of properly qualified veterinary surgeons*, and with a strong man at the head of the Veterinary Department in whose domain it lies. Its system of meat inspection can compare with any in the world; and when one considers that it has all been built up within about ten years, it is a speaking illustration of what can be done by determined and properly organised effort.

Will it never strike the British public that England is one of the few countries who lag behindhand in this respect? How few even of our wealthy and most densely populated towns have even a public abattoir, and how very few have a veterinary surgeon as meat inspector. The mere superficial knowledge which accompanies the possession of the meat inspector's diploma of the Sanitary Institute is excellent, and fulfils all that is requisite for a sub-inspector; but when that alone is taken, in conjunction perhaps with the still less knowledge of the subject possessed by a Medical Officer of Health, as evidence of proper fitness to assume the great responsibility of deciding upon the fitness or otherwise of animal flesh for human food, it is like the blind leading the

blind. In many instances great injustice is apt to be done to the possessor of the carcase, or the meat is passed on to be consumed by the unsuspecting public. No one is better qualified to act as meat inspector than the veterinary surgeon, and it is quite time that the British public insisted upon this protection to their interests, and that we of the veterinary profession made more efforts to obtain our rights in this direction.

Yours faithfully,
NEW ZEALANDER.

Books and Periodicals, &c., Received.

Board of Agriculture Returns; Report of the Department of Agriculture (Ireland); Veterinary News; American Veterinary Review; Journal of the Royal Army Medical Corps; Ceylon Agricultural Journal; North British Agriculturist; Farm and Home, Illustrated Kennel News; Journal of the Board of Agriculture; The Creamery Journal; Molassine Monthly; Rideal Walter Method of Standardising Disinfectants; Veterinary Phrenology and Therapeutics (Wallis Hoare); Recueil de Médecine Vétérinaire; Revue Vétérinaire; Bulletin Vétérinaire.

Letters and Communications, &c.

Mr. Howard; Colonel Nunn; Dr. Shattock; Dr. Bond; Mr. Henry Eve; Mr. Child; Mr. Townsend; Major Marriott; Dr. Somerville and Mr. Ainslie-Walker; Dr. Thieler; Syntax; Mr. Steele.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

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THE ANNUAL MEETING

. . WILL BE HELD IN .

THE UNIVERSITY, LIVERPOOL.

The Provisional Committee have arranged for four papers as follows:—

WEDNESDAY, JULY 25.

"Contagious Abortion,"
by Prof. BANG. Discussion opened by Principal Mettam.

"Animal Diseases following War,"
by Colonel HAZELTON. Discussion opened by Mr. Stafford Jackson.

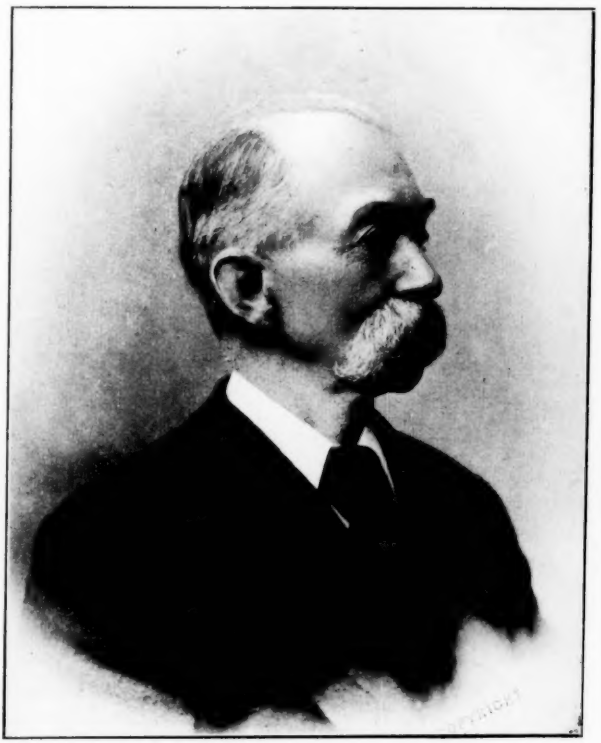
THURSDAY, JULY 26.

"Public Health and Veterinary Science,"
by Prof. BOYCE, F.R.S. Discussion opened by Mr. T. Eaton Jones.

"Ticks and Insects in Relation to Animal Diseases,"
by W. R. NEWSTEAD. Discussion opened by Mr. T. B. Goodall.

FRIDAY, JULY 27.

EXCURSION BY BOAT to Chester, Eccleston, and Eaton Hall.



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